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(61) Francis

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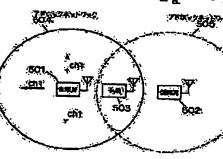
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(72)Inventor: YUBBHARA TOSHIYUNG

(64) MOBILE COMMUNICATION SYSTEM AND METHOD FOR AVOIDING ASYNCHRONOUS

zones constituted of respectively different mester asynchronous interference in a part on which two radio stations are overlapped. PROBLEM TO BE SOLVED: To avoid the occurrence of

station 502 receiving the interference notification signal 503 by the fixed number of times and sends an interference notification signal. The virtual master channel chil, errors are generated in the slave stations a channel oh! when the virtual master station 501 number of times in order to try communication by using an interference inspection signal by a certain fixed communicates with the slave station 503 by using the are overlapped. If the virtual master station 502 sends covered by respective virtual master stations 501, 502 on positions where mutual signals can't be received and a slave station 503 is located on a part where areas SOLUTION: Virtual mester stations 501, 502 are located



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udges that the channel chi cen't be used and executes communication by using the other

understands the occurrence of ssynchronous

interference in the area covered by the station itself

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In the drawings, any words are not translated

[Claim 1] In the migration communication system which consists of child offices which are communicating by the communication anode using TDMA between two or more key stations and said key station. The interference investigation signal for investigating whether in case it is going to use a certain channel of said use schedule. When [ which certied out count reception ] the generates in the receiving sid corresponding to the sandag-out sold of this interference investigation signal is received or an error packet is able to be defined beforehand. The key station which sepredule other error packet is able to be defined beforehand. The key than said use schedule chennel, Migration communication system characterized by consisting of with asynchronous interference having occurred and uses channels other child offices which send out asid notice signal of interference to said key station which judged with asynchronous interference having communication system characterized by consisting of with asynchronous interference having counted out count detection ] an orror packet was able to be defined beforehand, and has sent out said interference investigation signal.

[Claim 2] In the migration communication system which consists of child offices which are communicating by the communication mode using TOMA between two or more key stations and said key station. The interference investigation signal for investigating whether in case it is going to use a certain channel, asynchromous interference occurs in the channel of the use schedule is rotice signal of interference which notifies the purport which certical out count reception. If the generates in the receiving slot corresponding to the sending cut slot of this interference investigation signal is received or an error packet is able to be defined beforehand. The key station which judges with asynchronous interference station which judges with asynchronous interference having occurred, when the generating pattern of a key station of an error packet corresponds with the pattern which by consisting of child offices which send out said interference investigation signal. Migration communication system characterized which has sent out said interference investigation signal of interference to said key station of this sent out said interference investigation signal.

[Claim 3] Migration communication system accounting to claim 2 whose pattern with which a key station sends out said interference investigation signal is a pattern which sends out an interference investigation signal for every fixed period.

[Giaim 4] Migration

[Claim 4] Migretion communication system according to claim 2 which is the pattern which the pattern which a key station sends out said interference investigation signal cannot send out an interference investigation signal cannot send out an interference investigation signal for every fixed period, but sends out in the other period. [Claim 5] Migration communication system according to claim 2 which is the pattern from which the count by which the pattern with which a key station sends out said interference investigation signal continues and transmits an interference investigation signal between the state which do not transmit an interference investigation signal changes regularly.

Claim 6] Mignation communication system according to claim 2 which is the pettern from which he count by which the pettern with which a key station sends out said interference investigation

signal continues an interfurence investigation signal, and does not transmit it between the slots which transmit an interference investigation signal changes regularly.

(Chain 7) Microsics

[Claim 7] liftgration communication system according to claim 2 which is the count to which the pattern with which a key station sends out said interference investigation signal sends out an interference investigation signal continuously, and the pattern from which the interference investigation signal just behind that is continuously sent out, and is twisted, and a count changes regularly.

[Claim 8] The count to which the pattern with which a key station sends out said interference investigation signal sends out an interference investigation signal continuously, and migration communication system according to claim 2 it is [ communication system ] the pattern with which it continues, an interference investigation signal is sent out and twisted immediately after that, and a count becomes the same.

[Claim 9] Said child office is the enigration communication system of sight given in any 1 term from claim 1 which sands out said notice signal of interference by the pattern set up beforehand.

[Claim 10] Migration communication system according to claim 8 whose pattern with which a child office sends out said notice signal of interference is a pattern which sends out the notice signal of interference for every fixed period.

[Glaim 11] Migration communication system according to claim 9 which is the pattern which the pattern which the pattern with which a child office sends out said notice signal of interference cannot send out the notice signal of interference for every fixed period, but sends out in the other period.

[Claim 12] Migration communication system according to claim 9 which is the pattern from which

the count by which the pattern with which a child office sends out said notice signal of interference continues and transmits the notice signal of interference between the slots which do not transmit the notice signal of interference changes regularly.

[Claim 13] Migration communication system according to claim 9 which is the pattern from which

the count by which the pattern with which a child office sends out said notice signal of interference continues the notice signal of interference, and does not transmit it between the slots which transmit the notice signal of interference changes regularly.

[Claim 14] Migration communication system according to claim 9 which is the count to which the pattern with which a child office sends out said notice signal of interference sends out the notice signal of interference continuously, and the pattern from which the notice signal of interference itst behind that is continuously sent out, and is twisted, and a count changes

(Claim 15) The count to which the pattern with which a child office sands out said notice signal of interference sends out the notice signal of interference continuously, and migration communication system according to claim 9 it is [ communication system ] the pattern with which it continues, the notice signal of interference is sent out and twisted immediately after that, and a count becomes the same.

[Claim 16] Said key station is the migration communication system of 15 given in any 1 term from claim 1 which takes a synchronization to said notice signal of interference, and performs processing which checks that the input signal is a notice signal of interference when an error pecket is received in a receiving slot.

[Thirm 17] Call by the control of the processing slot.

(Claim 17) Said key station is the migration communication system of 16 given in any 1 term from claim 1 which sends out said interference investigation signal to all the transmitting slots on the carrier with which the channel of a use schedule belongs.

[Claim 18] Said key station is migration communication system according to claim 17 judged as asynchronous interference having occurred when the notice signal of interference is received in one which belongs on the cerniar which has sent out the interference investigation signal of receiving stats or an error packet is received.

[Claim 19] Migration communication system of 18 given in any 1 term from claim 1 said whose interference investigation signal is a signal non-become irregular.

[Claim 20] It is the asymptometric in a signal non-become irregular.

[Claim 20] It is the asynchronous interference evenion approach for evolving generating of asynchronous interference generated in the migration communication system which consists of

channels other than said use schedule channel. evasion approach which Judges with asynchronous Interference having occurred and uses received or an error packet is able to be defined beforehand The asynchronous interference receiving slot corresponding to the sending-out slot of this interference investigation signal is of interference which notifies the purport which esynphronous interference generates in the investigation signal. Said key station When [which carried out count reception] the notice signal notice signal of interference is eant out to said key station which has sent out said interference [ which carried out count detection ] an error packet is able to be defined beforehand. Said schedute. It judges with esynchronous interference having generated said child office, when use schedule, esynchronous interference generates it is sent cut to the charact of said use whether in case a certain channel tends to be used for said key station, in the channel of the more key stations and said key station. The interference investigation signal for investigating child offices which are communicating by the communication mode using TDMA between two or

out slot of this interference investigation signal is received or an error packet is able to be ssynchronous interference having occurred and uses channels other than seid use schedule defined beforehand. The asynchronous interference evesion approach which judges with key station which has sent out said interference investigation signal. Said key station When out said interference investigation signal. Said notice signal of interference is sent out to said which asynchronous interference generates in the receiving slot corresponding to the sendingwhich carried out court reception ] the notice signal of interference which notifies the purport generating pattern of a key station of an error packet corresponds with the pattern which sends schoolds. It judges with esymphrenous interference having generated said child office, when the use schedule, asynchranous interference generates it is sent out to the channel of said use more key stations and said key station. The interference investigation signal for investigating whether in case a certain channel tends to be used for said key station, in the channel of the child offices which are communicating by the communication mode using TDMA between two or asynchronous interference generated in the migration communication system which consists of [Claim 21] It is the asynchronous interference svasion approach for avoiding generating of

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JP,2002-118875,A [DETAILED DESCRIPTION]

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## DETAILED DESCRIPTION

Detailed Description of the Invention

multiplexing (TDMA:TimeDivision Multiple Access) between two or more key stations and this offices which are communicating by the communication mode which used time-division communication system about the migration communication system which consists of child approach for avoiding generating of asynchronous interference used especially in this migration Field of the Invention] This invention relates to the asynchronous interference evasion

systems can be used without making an alian system generate interference, and it can [0003] According to this TDMA method, the frequency more nearly same than two or more and is used by two or more circuits is adopted in much migration communication system. frequency circuit for the purpose of incressing the circuit capacity in the limited frequency band, cellular phoses, is spreading rapidly, the TDMA method which carries out time sharing of the same Description of the Prior Art] in recent years, since migration communication system, such as a

evolding generating of this asynchronous interference are proposed. asynchronous interference, the verious asynchronous interference evasion approaches for a system clock frequency shifts with time amount progress, interference will occur between two system which has adopted the TDMA mathod, since it is necessary to avoid generating of such systems. Such interference is called esynchronous interference. In the migration communication [0004] However, between the systems which are communicating using the same frequency, when

esynchronous interference evasion approach is used is shown in <u>drawing 14</u> . This migration \$9,7-67169,A First, the configuration of the migration communication system with which this constantesion system consists of a wireless communication control und 1, wireless contacts 2-[0005] One of the currentional asynchronous interference evasion approaches is proposed by , and migration mechines 6-9.

system. Moreover, to the wireless contacts 2, 3, 4, and 5, the wireless zones 10A, 10B, 10C, and wireless contacts 2–5 and the wireless communication control unit 1, moving in the inside of a communication control unit 1. The migration machines 6-9 are communicating through the circuit with the migration machines 6–9 to the bottom of management of the wireless contacts 2-5 are supervising the radio channel while performing setup and release of a wireless management of a migration machine, and wireless menagement of a system. The wireless UD are set up, respectively. or other migration communication system, and the wireless circuit in a system, migration (0006) Wireless line equipment ( is performing exchange control with a common public network

section 105, the communication channel control section 106, an asynchronous interference modem section 103, frama generation / decomposition section 104, the control channel control detacting element 107, the interface section 108, and a stat synchronizer 109, respectively,  $1\overline{2}$  . The wireless contacts 2–5 consist of the antenna section 101, the wireless section 102, the 0007] Heart, the configuration of the wireless contacts 2-5 in degring 14 is shown in drawing

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wireless contacts 2-5. including the asynchronous interference detecting element 107 are elmost the same as the configuration of the migration machines 8–9 with the interface section to a headset, and others generation / decomposition section 104. The interface section 108 only replaces the from the signal received in the interface section 108, and is controlling the slot timing of frame and the wireless contacts 2-5. The slot synchronizer 109 extracts a slot synchronizing signal interface section 100 is exchanging the data between the wireless communication control unit 1 the monitor of a radio channel, and is detecting the asynchronous interference wave. The about a communication channel. The asynchronous interference detecting element 107 performs about a control channel. The communication channel control section 106 is performing control from the modern section 103. The control channel control section 105 is performing control generation/decomposition of a TDMA signal to the baseband signaling outputted and inputted outputted and inputted from the wireless section 102. Frame generation  $\prime$  decomposition section the modem section 103. The modem section 103 is performing the strange recovery to the signal 104 is performing generation/decomposition of a frame while performing machines. The wireless section 102 is performing conversion with the radio signal transmitted and received in the antenna section 101, and the signal which are outputted and inputted from (0008) The antenna section 101 is transmitting and receiving the radio signal between migration

[0009] Noxt, they are explained using <u>drawing 18</u> about extuation of the migration communication system which adopted this conventional asynchronous interference evasion approach, using the migration machine 8 and the wireless contact 2 as an example, Here, the migration machine 6 and the wireless contact 2 carry out to it being under communication link using the slot 2 of a frequency f1. The slot for reserve channels (in this case, slot 4) which is not usually used is information about this empty carrier and the empty carrier is searched using that slot. The link, and is notified to the migration machine 6 as a notice of carrier information (in this case, a searched, updated and notified.

[0010] The wireless contact 2 measures the receiving level of two or more points of a slot during a communication link in the asynchronous interference detecting element 107, and reports the communication channel control section 106 in the meantime. When the communication channel control section 108 performs asynchronous interference detection in commotion with this measurement result and asynchronous interference is detected, it changes to the communication channel (a frequency (2, slot 4) notified as empty carrier information. To the origination mechine 8 detects that the signal transmission which has received until now carnot receive, and changes it to the communication channel (a frequency f2, slot 4) notified beforehand. Consequently, a communication channel (a frequency f2, slot 4) notified beforehand. Consequently, a communication channel change is performed without using the communication channel which received interference, and cutting of a wireless circuit can be the migration machine 8 side, and can also be operated similarly.

[0012] However, there are the following technical cantal contains the challed cantal can

[0012] However, there are the following technical problems in this conventional asynchronous interference evasion approach. First, the trouble in the case of it being vecent in a wireless contact side, and searching a cernier is pointed out. In this case, the empty cernier which comes out is an empty cernier in the installation of a wireless contact. Therefore, when the wireless contact 2 is using the frequency f1 and the side 2, for example in <u>desering 14</u>, although a frequency f1 and a slot 2 are not empty cerniers for the migration machine located in the part of it being vectors and recognizing a frequency f1 and a slot 2 to be cerniers. The problem (2013) In this case, although a means to manage the frequency and abot currently used with each configuration of a cell may receive effect in a building etc. greatly like PHS, it is difficult to difficult [ it ] to judge whether a certain frequency and slot are usable.

[2013] Next the trouble in the machine and size a certain frequency and slot are usable.

[0014] Next, the trouble in the case of it being vacent in a migration machine side, and searching

a carrier is pointed out. In this case, it will be vacant in a migration machine side, a carrier will be searched, and it will be notified to a wireless contact. Moreover, it becomes to detect generating of asynchronous interference a migration mechine side. And it will be known that asynchronous interference generated the wireless contact when the signal from a migration machine stopped. When it considers as such a configuration, there are the following troubles.

[0015] The 1st point is that a wireless contact needs to grasp all the migration machines that exist in their wireless zone first. The reason is that it detects esynchronous interference by saying that a wireless contact cannot receive the signal transmission from a mabile station which was able to receive until now.

(0018) The 2nd point is points that a wireless contact always needs to supervise the existence of the input signal of all migration machines. By this approach, when migration machines are a large number, the lead of processing with a wireless contact will become large.

[0017] The 3rd point is being unable to determine which channel should be used, when a channel which is vacant from each migration machine and is different as a channel is notified, and asynctronous interference occurs.

[Problem(s) to be Solved by the Invention] in the part which two wireless zones which consist of conventional asynchronous interference evasion approaches mentioned above with a diffurent wireless contact overlap, there was a trouble that generating of asynchronous interference was inneresting or asynchronous interference was a trouble that generating or asynchronous interference was a

[0019] The purpose of this invention is offering the asynchronous interference evasion approach generating of asynchronous interference generated in the part which two mireless zones constituted by different wireless contact overlap being avoidable.

[0020]

overlaps between two key stations which cannot receive a mutual signal is resizable with a asynchronous interference which may be produced in the part to which each area to cover (1922) Therefore, the unigration communication system which can avoid generating of that asynchromous interference will occur, and other channels will be used for it. Thereby, if the channel is used, the key station which is going to use a certain channel can know the notice signal of interference to the key station which is going to use a certain channel. that asynchronous interference will occur, if that key station uses this channel, and it sends out packet will occur with the interference investigation signal. Therefore, a child office can know sends out an interference investigation signal before using the channel in a child office, on error occurred, and it is characterized by consisting of child offices which send out said notice signal en error packet is able to be defined beforehand, it judges with asynchronous interference having imple configuration [0021] If according to this invention the key station which is going to use a certain channel of interference to said key station which has sent out said interference investigation signal uses channels other than said use schadule channel, When [ which carried out count detection ] of this interference investigation signal is received or an error packet is able to be defined beforehand The key station which judges with asynchronous interference having occurred and esyndronous interference generates in the receiving slot corresponding to the senting-out slot carried out count reception ] the notice signal of interference which notifies the purport which channel of the use schedule is sent out to the channel of said use schedule. When [ which or more hay stations and said key station. The interference investigation signal for investigating of child offices which are communicating by the communication mode using TDMA between two whather in case it is going to use a certain channel, asynchronous interference occurs in the communication system of this invention in the migration communication system which consists [Means for Solving the Problem] In order to attain the above—mentioned purpose, the migration

(0023) Moreover, other migration communication system of this invention is set to the migration communication system which consists of child offices which are communicating by the communication mode which used TDMA between two or more key stations and said key station. The interference investigation signal for investigating whether in case it is going to use a certain channel, asynchronous interference occurs in the channel of the use schedule is sent out to the

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out seld notice signel of interference to seld key station which has sent out said interference investigation signal. interference having occurred, and it is characterized by consisting of child offices which send pattern which sends out said interference investigation signal, it judges with esynchronous channel. When the generating pettern of a key station of an error pecket corresponds with the esynchronous interference having occurred and uses channels other than said use schedule received or an error packet is ebbo to be defined beforehand The key station which judges with receiving slot corresponding to the sending out slot of this interference investigation signal is interference which notifies the purport which asynchronous interference generates in the channel of said use schedule. When [ which carried out count reception ] the notice signal of

investigation signal is sent out and bristed immediately after that, and a count becomes the investigation signal continuously, and the pattern with which it continues, an interference bristed, and a count changes regularly, and may be the count which sends out an interference which the interference investigation signel just behind that is continuously sent out, and is and sends out an interference investigation signal continuously. You stay be the pattern from pattern from which the court which does not continue and trensmit an interference investigation which a key station cands out said interference investigation signal The count which may be the not transmit an interference investigation signal charges regularly. Furthermore, the pattern with eignal between the slots which transmit an interference investigation eignal changes regularly, which continues and transmits an interference investigation signal between the slots which do faced period, but sends out in the other period, end it may be the pattern from which the count period, it may be the pattum which cannot send out on interferance investigation signal for every signed may be the pettern which sends out an interference investigation signed for every fixed [0024] Mareover, the pattern with which a key station sends out said interference investigation

of interference continuously, and the pattern with which it continues, the notice signal of anttern defined beforehand and the generating pattern of a key station of an error packet according to this invention a child office sends out the notice signal of interference by the interference is sent out and twisted immediately ofter that, and a count becomes the same. twisted, and a count changes regularly, and may be the count which sends out the notice signal from which the notice signal of interference just behind that is continuously sent out, and is nvestigation signal. he key station which was going to use a certain channel and sent out the interference 20rrespands with the pattern, it can know certainly that asynchronous interference generated [0027] Since he is trying to judge with esynchronous interference having occurred when signal of interference between the slots which transmit the notice signal of interference changes which changes regularly in the count which continues and transmits the notice signal of interference between the dots which do not transmit the notice signal of interference. Moreover, resularly, and sends out the notice signel of interference continuously, You may be the pattern which may be the pattern from which the count which does not continue and transmit the notice the pattern with which this child office sends out said notice signal of interference The count interference for every fixed period, but sends out in the other period, and may be the pattern every fixed period, end it may be the pattern which cernat send out the notice signal of aignal of interference may be the pattern which sends out the notice signal of interference for by the pattern set up beforehand. The pattern with which this child office sands out said notice [0025] Furthermore, you may make it said child office send out said notice signal of interference occurred, the count sent out in an interference investigation signal can reduce. succession, as compared with the case where it judges with asymptronous interference having corresponds with the pattern, when the count error packet of fixed merely occurs only in pattern defined beforehand and the generating pattern of a child office of an error packet according to this invention a key station sends out an interference investigation signal by the [0025] Since he is trying to judge with asynchronous interference having occurred when

ucket is received in a receiving stot, said key station takes a synchronization to said notice 0028] Moreover, in other migration communication system of this invention, when an error

> signal is a notice signal of interference. signal of interference, and may be made to perform processing which checks that the input

error packet generated according to a certain factor, and asynchronous interference having from a child office can be received, it can prevent incorrect-recognizing it as having received the use a certain channel being a notice signal of interference and the notice signal of interference [0029] Since according to this invention it can be recognized as the key station which is going to

the carrier with which the channel of a use schedule belongs. signal in other migration communication system of this invention to all the transmitting slots on [0030] Furthermore, you may meke it said key station send out said interference investigation

cerriar which has sent out the interference investigation signal of receiving slots or an error said key station, when the notice signal of interference is received in one which belongs on the [0031] Furthermore, you may make it judge with asymphronous interference having generated

iderference, it can investigate easily whether asynchronous interference has occurred According to this invention, since it is not necessary to newly define the notice signal of packet is received in other migration communication system of this invention. [0032] Furtharmore, said interference investigation signal may be a signal non-become irregular.

detail with reference to a drawing. [Embodiment of the Invention] Next, the gestalt of operation of this invention is explained to a

office may correspond. In order for two or more child offices to share 1 of the slot for reception so that the receiving stat of an assumed parents station and the transmitting slot of a child slot of an assumed parents station and the receiving slot of a child office may correspond, and essumed parents station itself, a child office takes a synchronization so that the transmitting station takes other equipments and a synchronization but operates to the slot timing of the channel per ad hoc network is used. Although it does not carry out that an assumed parents method here, and a TDMA multiplex number is 4. In this migration communication system, one used TDNA-TDD (Time DivisionMultiple Access-Time Division Duplex) is used as an access operation gastelt — the cordless handset of PHS — the cerrier for a between direct message is [0035] the communication link between an assumed-perents station and a child office — this parents station or a child office, and other equipments serve as a child office. assumed parents station out of two or more equipments which can also become an assumedparents station 113 and the child offices 110, 111, and 112 is the same, one set becomes an the essumed parents station 113 exists in one system. The internal structure of the assumedthat spot, and is a system of the assumed-parents station mediation mold with which one set of of the 1st operation gestalt of this invention. Reference of drewing 1 constitutes this migration communication system from en assumed-perents office 113 and two or more child offices 110, 111, end 112. This migration communication system is the ad hoc network which can \*\*\*\*\* on migration communication system which applies the asynchronous interference systion approach [0034] (1st operation gestait) <u>Previns (</u> is the block diagram showing the configuration of the

direction packet for collision control of going down) is always sent out to the child office using KNAA-PE, it gets down for collision control and the direction packet (it is hereafter called the Access with Partial Echo) technique is used as the control approach of such a collision. In [0006] In this migration communication system, the ICMA-PE (Idle-signal Costing Multiple he transmitting slot

or more child offices may not send out a packet to coincidence.

of the assumed-parents station 113 slot, it is necessary to perform collision control so that two

collision control of going down, and .. the assumed parents offices 113 by receiving these direction packets 2001, 2002, and 2003 for the assumed parents office 113, and the child office 110 can take the synchronization between to <u>drawing 2</u> between the assumed parents offices 113. In <u>drawing 2</u>, the direction packets 2001, 2002, and 2003 for callision control of going down and .. are periodically transmitted from ,0037] The child office 110 explains the ectuation which takes a synchronization with reference

[0038] Moreover, the configuration of these direction packets 2001, 2002, and 2003 for collision

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being vecant and coming out of it, the packet for collision control is continuously sent out using there is any channel, and I an essumed parents station according to a certain procedure, and it Information which the load station sent is received correctly. It uses for whether the error detection field 305 has an error in the packet which received, and it checking, when judged with transmit information, and goes into a resending procedure. It uses for judging whether the partial echo field 305 displays some received data, a child office collates it with this information, and the investigating ( whether when builting an ad hoe network, it is vacent in an available channel and receiving "during signal transmission, the child office under data packet transmission helts corrected, nor the signal is received, it indicates "un-receiving." When it indicates "unreceived correctly, and when neither the case where there is an arror which cannot be forbidding access from other child effices when data are being received from a certain child office. Reception / non-receiving bit 304 displays "reception", when a signal without an error is station to a child office. A free line / prohibition bit 303 is used for displaying "prohibition" and pattern, It gets down end en information signal 302 is data transmitted from an essumed-parenta [0039] Unique WORO 301 is the field for taking a synchronization, and is a certain decided bit receiving bit 304, the partial echo field 305, and the error detection field 306. 301, the gaing-down information signal 302, the free line / prohibition bit 303, reception / nonpackets 2001, 2002, and 2003 for collision control of going down and ... consist of unique WORD control of going down and .. is shown in drawing 3. According to drawing 3, the direction

out, the packet receiving result storage section 408, an interference detecting element 408, and control section 40%, the count storage section 407 of interference investigation packet sending the TDMA-TDD processing section 404, the ad hoc protocol processing section 405, the channel invantion and a child office is shown in <u>drawing 4</u>. Reference of <u>drawing 4</u> constitutes this equipment from the RF section 401, the clock generation section 402, the seltenna section 403, [0040] Next, the configuration of the assumed-parents office in the 1st operation gostalt of this

notified to the ad hoc protocol processing section 405. when data are received by the specified channel and a CRC error is detected, it has the function processing section 405. The function notified to the ed hop protected processing section 405 when receiving data by the specified charmel and unique WORD is not able to be detected. And to investigate the received field strength of the channel specified by the ed hoc protocol protocol processing section 405 to the channel specified using the RF section 401, The function protocol processing section 405. The function to transmit the data specified from the ad hoo channel specified by the ad hoc protocol processing section 405, and to pass it to the ad hoc section 404 performs processing about TDMA-TDD. The function to receive the data of the modulation, and a recovery. The clock section 402 generates a periodic clock signal, and supplies The antenna section 403 transmits and receives an electric wave. The TDMA-TDD processing the generated clock signal to the RF section 401 and the TDNA-TDD processing section 404. [0041] The RF section 401 performs transmission and reception of an electric wave, a

of a channel, and this functions at the time of ad hoc network construction and interference control section 403 has the function to determine the channel used by investigating the opening section 404, in order to play the role which builds and maintains an ad hoc actorork. The channel transmit and receive the data about the high order layer 410 through the TDMA-TDD processing (0042) The ad hos protocol processing section 405 has the function which transmits and receives a control signal through the TDMA-TDD processing section 404, and the function which

out in order to investigate whether asynchronous interference occurs in the channel of a use measorizes the count of sending out of the interference investigation signal which is a signal sent [0043] The count starage section 407 of interference investigation packet sending out

received only the predetermined slot from the slot under current reception at the past period. reception -CRO error unique WORD un-detecting / decode impossible signed in the slot which [0044] The pecket receiving result storage section 408 manurizes the receiving result (normal

> gostalt is explained to a detail with reference to a drawing. [0045] Next actuation of the asynchronous interference evasion approach of this operation high order layer 410 is application which transmits and receives data using an ed hoc protocol shot under current reception memorized by the packet receiving result storage section 40%. The the pest period, asynchronous interference has generated only the predetermined slot from the then a predetermined number (packets other than normal reception) is in the receiving result of The interference detecting element 409 judges whether based on whether the error packet mon

participated in this ad hoc network 504 is explained using drawing 4 - drawing 9. the ed has naturark 505 using a channel chil under the situation that the child office 503 has using a channel chill as shown in <u>drawing 5</u> , and the assumed parents office 502 is going to hold [0048] Actuation in case the assumed-parents office 501 is holding the ad hoc natwork 504

is shown in the flow chart of drawing 7. [0047] Actuation of the child office 500 in the migration communication system of this operation gestalt is shown in the flow chart of <u>drawing 6</u> , and actuation of the assumed-parents office 502

[0051] In addition, N, n1, n2, and n3 are positive integer values, and they are the value of which N>n3\n2\n1 consists. For example, they are N= 240, n3=120, n2=110, and a value, such as changes a channel to the assumed-parents station under current communication link child office 503 sends out the charmel change demand signal which notifies the purport which a past N packet has occurred n 3 times or more, since the CHANE does not fulfill criteria communication link quality, processing which changes a channel is performed. In this case, the essumed parents station 501 and the child office 503, when the number of the error packets of directions of the channel control section 408. Moreover, in the communication link between the maximum number which sends out an interference investigation packet continuously with packets in a past N packet, and the packet receiving result storage section 408 sets to n2 the criteria judged as asynchronous interference having occurred with the number of the error receiving rasult is set to N, the interference detecting element 409 sets to n1 the number of the to be what is a signal decipherable [ with the ad hoc protocol processing section 405 ] error is not detected, but it is explained, assuming the signal which the child office 503 received office 503, an error packet is not generated, but detection of unique WORD is successful, a CRO [0050] Moreover, in subsequent explanation, the number of the slots which memorize the (10049) Here, by the communication link between the assumed perents station 501 and the child has taken the synchronization between the assumed parents offices 501. received these direction packets 2001 and 2002 for collision control of going down, and ., and packets 2001 and 2002 for collision control of going down, and ... and the child office 503 condition that nothing has transmitted, using the flow chart of drawing 6. In such a case, as transmitted using the transmitting slot of a channel ch1, a condition 501, i.e., an assumed-parents office, before the assumed-parents office 502 holds the ad hoc network 505, the shown in <u>drawing 8</u> , the assumed-parents office 501 has transmitted periodically the direction essumed parents office SO2 explains the actuation about reception of the child office SO3 in the [0048] First, although the direction packet for collision control of going down is always

for collision control of going down, the received signal is processed in the ed hoc protocol of being an interference investigation packet was performed (step 608) is the direction packet processing section 405 (step 609) passed to the ad hos protocol processing section 405 (step 605). It judges whether the ad hos (step 607). Next, since the signal which the received signal received here although the judgment hera, having received normally in the packet receiving result storage section 408 is recorded protocal processing section 405 can decode the signal (step 606), and since it is decipherable CRC error is detected (step 804). Here, since a CRC error is not detected, the received signal is Here, if unique WORD is detected, it will be accumulated, and it is investigated whether next a from the received signal (step 602), and it judges whether unique WORD is detected (step 603). 801). The TDMA-TDD processing section 404 takes out the signal of the slot of a channel chi belongs by the RF section 401, and passes it to the TDMA-TDD processing section 404 (step [0052] First, the child office 503 receives the signal on the cernier with which a channel chi

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processing is not performed but the following signal is received. more than n1 (step 611). Here, since the number of error packets is less than [ n1 ], special [DO54] Next, ectuation of the assumed-parents office 502 in case the assumed parents office generated, the number of error peckets becomes less then [n3], and it is judged whether rest the aumber of error packets (unique WORD packet which is not detected [ a CRC error or ]) is packet, and it is judged whether the number of error packets (unique WORD packet which is not dstacted [ • CRC error or ]) is more than n3 (step 810). Here, since the error packet is not (0058) Next, the interference detecting element 409 investigates the receiving result of a past N

502 is going to hold the ad hoc notwork using a charmel chi is explained using the flow chart of

parents station 502 does not exist, one of the fallowing three cases produces the child office in which a synchronization is taken between the assumed perents station 501 and the assumedtransmitted is expirined using  $\underline{digning}$   $\underline{\theta}$  from the assumed parents office SCZ. Since the device approach investigated by the transmitting side, and the same approach. When it judges that a term (step 713), and it investigates shortly whether a receiving side slot is also usable by the [0058] Here, ectuation of the child office 503 when an interference investigation signal is recolving side slot is usebbe similarly, it judges with the channel being usable (step 714) stot is usable, the transceiver timing of the assumed parents station 502 is shifted a semicircle receiving side was usebbe (step 712). Here, since it is not checking that only a transmitting-side usable (step 710). It means that it was here judged with a transmitting-side slot being usable. [D057] Next, it investigates whether it checked that the slot of both a transmitting side and a interference investigation signal does not occur, but judges that asynchronous interference is investigation packet sending out in step 709 being more than n2, the slot which sent out the packet is again transmitted in the following transmitting slot (step 706). [0056] When judged with the value stored in the count storage section 407 of interference more than n2 (step 709). When the value is not more than n2, an interference investigation value stared in the count storage section 407 of interference investigation packet sending out is When the notice pecket of interference or an error packet is not received, it judges whether tha receiving slot immediately after transmitting an interference investigation packet (step 708), investigates whether the notice packet of interference or an error packet is received in the the count storage acction 407 of interference investigation packet conting out (step 707). And it storage section 407 of interference investigation packet sending out, and the value is stored in pocket is transmitted (etcp 706), I is added to the count currently recorded on the count interference investigation pecket sending out (step 705). And an interference investigation assumed-parents station 502 sets to 0 the value memorized by the count storage section 407 of detected similarly (step 703). Similarly in this case it is not detected (step 704). Then, the whether in a receiving-side slot, the field strength beyond the four continuation threshold E is strength beyond a threshold E is not detected from an assumption (step 702). Next, it supervises channel chil first using the TDMA-TDD processing section 404 (step 701). In this case, the field beyond the four continuation threshold E is detected, and ] the transmitting-side dot of a channel. Specifically, the essumed parants station 502 supervises [whather the field strength parents stetion 502 may hold en ed hoc network, chi is vecent and it investigates whether it is e the charmel chi measured in the assumed-parents office 502. First, in order that the assumedchannel is being used for the received field strength in the transmitting slot and receiving slot of outside of the ed hoo natwork 604, it shall be below a threshold (it sets with =E) judge that this (0055) Here, as shown in  $rac{drawing 5}{2}$  , since the assumed-parents office 505 is located in the

usually sent out the direction packet for collision control of going down, this is ectually a rare so interference investigation algosl in this case, since the assumed parents station 50) has the receiving timing and chance of the child office 503 first. Although a child office is received as investigation aignal from the assumed-parents station 502 ] no signals also in accordance with (19059) (1) The case where the assumed-parents station 501 has transmitted [the interference

[0080] (2) Next, the case in which (2) assumed parents station 501 has sent out a certain signal

collide. In this case, the child office 503 will datect a CRO error. signal from the unique WORD part and the assumed-parents station 502 of the signal did not agreement with the receiving timing of the child office 500, and the interference investigation when the interference investigation signal from the assumed-parents station 502 is not in

unique WORD un-detecting 502 of the signal collided although the signal was sent out. In this case, the child office 503 is interference investigation signal from the unique WORD part and the assumed parents station office 903 and the assumed-parents station 601 has sent out no signals is the case in which the from the assumed parents station 502 is not in agreement with the receiving timing of the child [0081] (3) Moreover, the assumed parents station 501 when the interference investigation signal

asynchronous interference having generated the interference detecting element 409, and the and the TDMA-TDD processing section 404 (step 818). notice signal of interference is transmitted through the ad hoc protocol processing section 405 this case, since the packet which received is an interference investigation signal, it judges with the packet which received judges whether it is an interference investigation signal (step 608). In carried out normal reception on the packet receiving result storage section 408 (step 607). Next not detested (step 605). It judges whether the ad hoc protocol processing section 405 can decode the received signal (step 606). In this casa, since it is decipherable, it records having input signed is passed to the ed has protocol processing section 405 noting that a CRC error is (0083) First, the case where (1) occurs even once among of times is explained. In this case, the eighal of the cernier specified in the RF section 401 is raceived, and the TDMA-TOD processing WORD has a CRC error next at that which is detected (step 603) (step 604). In this case, an section 404 is passed (step 601). Next, the signal of the decided stat is taken out in the TDMA-IDD processing section 404 (step 602). As a result of taking out, it investigates whether unique Actuation of the child office 503 at that time is explained using the flow chart of diamins 6 . <u>धावभाषात है</u> , the case of above (1), (2), and (3) is generated continuously once [ sun total n transmits 1 9001-900h of continuation of time interference investigation signals as shown in [0032] Unless a packet loss will be carried out the middle if the assumed parents office 502

generated, and the case of (3) are generated, it explains to according to in front of step 610, WORD. Next, since ortustion differs by the case where the case where the case of (2) is ebout is explained. In this case, it is the same as that of the case of (1) until it chacks unique [0084] Next, when the case of (2) or (3) is generated, actuation of the child office 503 of en

packet receiving result storage section 408 (step 613). had protocal processing section 405 received the unique WORD non-detected packet in the packet to the ad hoc protocol processing section 405 (step 612). Then, it records that the ad notifies that the TDMA-TDD processing section 404 received the unique WORD non-detected [0065] Since unique WORD cannot be detected when the case of (3) is generated (step 603).

error in the packet receiving result storage section 408 (step 815). received the packet of a CRC error to the ad hoc protocol processing section 405 (step 614). Than, it records that the ad hoc protocod processing section 405 received the packet of a CRO this case, since a CRC error is detacted it notifies that the TDMA-TDO processing section 404 WORD is detected (step 603), it judges whether next the CRC error has occurred (step 604), in (10088) Next, the case where the case of (2) is generated is explained. In this case, since unique

asynchronous interference having generated the interference detecting element 409, and as packets memorized by the packet receiving result starage section 408 is n1, it judges with packets in a pest N packet is more then n1 time (step 811). Here, since the number of the error channel changa demand signal is not sent out. Naxt, it is judged whether the number of the error N packet, delivery sending cut of the channel change dearland signal is carried out at the TDMAdetecting and CRC error / decode impossible) packet has occurred n 3 times or more in a past TDD processing section 404 (step 817), Here, since the number of error packets is nii time, a reference to the packet receiving result storage section 408. When the error (unique HORD uninterferance detecting element 409 investigates the receiving situation of a past N packet with [0087] Henceforth, the case of the case of (2) and (3) is explained collectively again, Next, the

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explained using the Bow chart of <u>drawing 7</u>. office 502 after the notice signal of interference was sent out from the child office 503 is 503 about all the cases of (1), (2), and (3), respectively. Next, actuation of the assumed parents protocol processing section 405 and the TDMA-TDD processing section 404 (step 618). shown in stawing 9, the notice signal 910 of interference is transmitted through the ad boo [1068] As explained above, the notice signed of interference is transmitted from the child office

interference, but receives it as an error packet. recognize the notice signel 910 of interference from the child office 503 to be a notice signal of office 500 cannot be taken, as shown in <u>drawing 9</u> , the assumed-parents office 502 cannot received. However, when the synchronization of the assumed percents office 502 and the child signal of interference from the child office 503 to be a nodice signal of interference, and can be office 503 can be taken by chance, the assumed parents office 502 can recognize the notice 65 on error packet. When the synchronization of the secumed-parents office SQ2 and the child transmitted from the child office 503 is received as a notice signal of interference, or to receive (0089) In this case, the assumed-parents station 502 is whether the notice signal of interference

occurred, and will judge the channel that use is impossible (step 711). 706), the assumed-parents station 502 will judge with asynchronous interference having [9070] If the notice signal of interference or one signal of the error packets is received (step

[0072] For example, it will be set to n5=n3-n2=120-110=10 if the congrete number in this carried out in the sense of a check ] — judging — you may make. this operation gostsk two or more times, when continuation n5 (14n54n3-n2) time reception is repeating the interference investigation by the asynchronous interference evision approach in E that asymphronous interference has occurred after making it judge with it being unusable or of interference and generates by other factors by chance, it takes into consideration, a terrain office 503 transmitted as a packet of a CRO error Also when it is not based on the notice signal notice packet of interference, this is for securing the robustness over the interference investigation packet which the assumed-parents station 502 sends out locking. Furthermore, when the assumed parents office 502 receives the notice signal of interference which the child is a larger count than n1 (100) which is a threshold for the child office 503 to send out the maximum n2 (110) time sending out of the interference investigation packet. Although this value the modice signal of interference is \*\*. Moreover, the essumed-parents station 502 carries out the interference investigation signal, processing of what is not performed, either and it is, and the motice signal of interference only to the assumed parents office 502 which has transmitted the interference investigation signal like the assumed-parents office 501 of <u>drawing 5</u> receives [0071] In addition, even if the essumed-parents office which is effective and has not sent out

[0078] As explained above, according to the migration communication system of this operation makes no 10 times or more. channel change signal to the assumed-parents station 501, when having specified the upper limit the child office 503 will receive an error pecket 120 times or more continuously and sends out a operation gestait is applied. That is, n5 becomes between 1 to 8 in this case. Thus, it is because

parents office which is going to use a channel. Thus, since generating of asynchronous makes the natios signal of interference the notice signal of interference, or it receives as en interference detects [ the notice from a child office ] by the asynchronous interference evasion arror packet. It can know that asynchronous interference has generated by this the assumed rolice signal of interference. Then, the assumed parents station which is going to use a channel station which is going to use the channel for generating of asynchronous interference with the interference occurs, the child office which exists there will notify that to the essumed parents asynchronous interference occurs in the duplication part of erea by it. If asynchronous multiple-times sending out of the interference investigation packet is carried out. Then, [0074] The reason is as follows. First, before an assumed parents station uses a channel becomes possible to resize without moreover using a complicated controlling mechanism. mutual signal, and the part to which each area to cover overlaps among 502 is evolded, and it interference which may be produced in the assumed-parents office 501 which cannot receive a gestait, and the asynchronous interference evasion approach, generating of esynchronous

> of the sending out pattern of the interference investigation signal memorized by this interference investigation signal sending-out pattern storage section 1007 is shown in <u>drawing</u> memorized the sanding-out pottern of an interference investigation signal. The concrete example [0077] The interference investigation signal sending—out pattern storage section 1007 has investigation signal sending out pattern storage section 1007 is newly edded. socium 407 of interference investigation packet sending out is deleted, and the interference detecting element 1009 and the channel control section 1006, respectively, the count storage of this operation gestalt and a child office is shown in  $extit{drawing 10}$  . To the configuration which interference detecting clament 409 and the channel control section 406 replace the interference gestaft of this invention and the esynchronous interference evasion approach are explained. an assumed parents station exists in area, and supervises each child office is unnecessary. showed the assumed parents office and child office in this operation gastalt to drawing 4, the [0076] The configuration of the assumed parents office in the migration communication system [9075] (2nd operation gastail) Next, the migration communication system of the 2nd operation approach of this operation gestelt, complicated control which grasps all the child effices where

[DOED] Next, actuation of the migration communication system of this operation gestalt is interference invastigation signal continuously. investigation signal sending out pattern storage section 1007 rather than sends out an operation gestalt sends it out with the sending-out pattern memorized by the interference sending out pattern storage section 1007. Moreover, the channel control section 1006 in this generating pattern of an error packet is memonized by the interference investigation signal notice signal of interference, when a agreement with the sending-out pattern with which the <BR> [0079] The interference detecting element 1008 in this operation gestalt sends out the out pattern is a pattern beforehand defined basides the above, it may be what kind of pattern. pattern, such as a pattern ( drawing !! (f)) which is changed at random. As long as this sendingthe same, and the count which sends out an interference investigation signal can consider a the interference investigation signed just behind that are sent out and twisted, a count is made to which specing is made to increase in proportion to time amount The count which sends out a amount ( <u>drawing 11</u> (e)), (4) The count which the interference investigation signal sent out, and investigation signal is sent out and buisted and a count is made to increase in proportion to time interference investigation signal is sent out and there is nothing — a pattern ( drawing ! ! (c) —) interference investigation signals of sending out are sent out in the other period (or), an <u>drawing 11</u> (d) (3) interference investigation signal, and a pattern to which an interference signal cannot be sent out every fixed period, but the pattern (  $\frac{d \cos \sin \frac{1}{2}}{10}$  (b)) and (2) investigation signal every (1) fixed period ( <u>drawing 11</u> 8> 1 (a)), Or an interference investigation [0078] This sanding out pattern For example, a pattern which sends out an interference

is desirable for the pattern which an error packet may generate in the actual field to be a completely different pattern. interference investigation signal cending out pattern storage section 1007. As for this pattern, it secording to the pattern which is sent out continuously and which is memorized by the the assumed parents station 502 uses a channel, there is nothing then and it is sent out [0081] With this operation gostalt, in case an interference investigation signal is sent out before

out pattern with which the generating pattern of an error packet is memorized by the interference investigation signel sending-out pattern storage section 1007. The assumed parents the notice signal of interference immediately. In such a case, the interference detecting element immediately when an interference investigation packet is received, the child office 503 sends out storage section 1007. Since it can judge with what asynchronous interference has generated sanding—out pattern memorized by the interference investigation signal sending—out pattern 1009 sands out the notice signal of interference to except, when in agreement with the sendingwith the receiving result memorized by the packet receiving result storage section 408 and the explained. The interference detecting element 1009 of the child office 503 is serially collated (0082) Next, actuation in case a child office sends out the notice packet of interference is

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several times, you may judge. interference, in this case, in order to secure certainty, as a result of repeating this pattern parents office 502 which is going to use the channel chil can know generating of esynchronous packet of interfarence is received at this time or an error packet is received, the assumedinterference investigation signal sending—out pattern storage section 1007. When the notice interference or an error packet is received, efter sending out the pattern mamorized by the station 502 which is going to use the channel chi supervises whether the notice signal of

of an interference investigation signal. signal by using the pattern which is hard to generate in the actual field as a sending-out pattern [0083] This operation gostalt can roduce the count which sends out an interference investigation

(0088) The actuation in the migration communication system of this operation gestalt is shown in with the notice signal of interference eent out from the child office 503 only differ. shifts receiving timing so that the assumed parents office 502 may take the synchronization batureen the assumed parents office 502 and the child office 503, performing processing which same as the configuration shown in drawing. I, and when the synchronization cannot be taken [0085] The configuration of the migration communication system of this operation godalt is the sestalt of this invention and the asynchronous interference evasion approach are explained. [0094] (3rd operation gestalt) Next, the migration communication system of the 3rd operation

whather it tries repeatedly soverel times and the channel chil is used. and use of the channel is suspended. When it is impossible to take a synchronization, it judges interforence (notice signal 9100 of interference), it is recognized as interference having occurred As a result of a synchronization being able to take and receiving when it is a notice signal of synchronization may be taken to these notice signals 9101, 9102, and 9103 of interference, and ... chil it stops sending cut an interference investigation signal, and it tries so that a recoived in a receiving shot, the assumed parents station 502 which is going to use the channel channel with this operation gestelt has sent out the interference investigation signate 9001 and 9002 and . When an error packet (error packet by the notice signal 9101 of interference) is  $ext{density} 12$  . To the midst to which the assumed parents station 502 which is going to use a

9101, 9102, and 9103 of interference, and \_ detected esynahronous interference in this case can take a synahranization to the notice signals the interference investigation signals \$001 and \$002 and .. and the child effice 503 which that the essumed parents office 502 which is going to use the channel may stop sending out of (0087) In addition, only sufficient count needs to send out the notice signal of interference so

asynchronous interference having occurred. recognizing it as having received the error packet generated according to a certain factor, and notice signal of interference from the child office 503 can be received, it can prevent incorrectoffice 502 which is going to use the channel chi being a notice signel of interference end the (1008) Since according to this operation gestalt it can be recognized as the sesumed parents

sending-out pattern storage section 1211 of interference is newly added. detecting element 1209 and the channel control section 1208, respectively, and the notice signal interference detecting element 409 and the channel control section 408 replace the interference the assumed-parents office and child office in this operation gostalt to drawing 4 , the operation gostelt and a child office is shown in <u>drawing 13</u> . To the configuration which showed configuration of the assumed parents effice in the migration communication system of this gostait of this invention and the asynchronous interference evasion approach are explained. The [0089] (4th operation gastait) Next, the migration communication system of the 4th operation

out pattern storage section 1211 of interference, a pattern as shown in <u>drawing [1]1</u>] can be sending out pattern of the notice eignal of interference memorized by this notice signal sendingthe pattern which sends out the notice signal of interference. As a concrete example of the [0090] The notice signal sending-out pattern storage section 1211 of interference memorizes

interference every (1) fixed period ( <u>drawing 11</u> (a)), Or the notice signal of interference connet storage section 1211 of interference For example, a pattern which sends out the notice signal of [0091] That is, the sending out pattern memorized by the notice signal sending out pattern

> besides the above, it may be what kind of pattern. is changed at random. As long as this sending out pattern is a pattern beforehand defined the notice signal of interference can consider a pattern, such as a pattern ( <a href="mailto:signaling">signaling</a> (f)) which behind that are sent out and twisted, a count is made the same, and the count which sends out count which the notice signal of interference sent out, and the notice signal of interference just twisted and a count is made to increase in proportion to time amount ( drawing 11 (e)), (4) The R) (d)(3) interference, and a pattern to which the notice signal of interference is sent out and increase in proportion to time amount The count which sends cut the notice signal of drawing [] is sent out and there is nothing — a pattern ( <u>drawing 11</u> (c) —) to which spacing is made to interference of sending out are sent out in the other period (or), the notice signal of interference be serd out every fixed period, but the pattern ( drawing 11 (b)) and the notice signal of (2)

packet which received is in agreement with the sending-out pattern memorized by the notice packet is a notice signal of interference, and the channel control section 1206 in this operation notice signal sending—out pattern storage section 1211 of interference. Horsever, the error signal sending out pattern storage section 1211 of interference. gestalt judges with asynchronous interference having occurred, when the pattern of the error sends out the notice signal of interference based on the sending-out pattern mamorized by the this operation gestalt cominues the notice signal of interference, and does not send it out, but it (0092) Whan asynchronous interference is detected, the interference detecting element 1209 in

[0090] Next, actuation of the migration communication system of this operation gestalt is

currently recorded on the notice signal sending out pattern storage section 1211 of interference interference, it sends out the notice signal of interference based on the sending-out pattern rather than sends out the notice signal of interference continuously [0094] With this operation gestalt, in case the child office 503 sends out the actice signal of

the actual field to be a completely different pattern. [0095] As for this pattern, it is desirable for the pattern which an error packet may generate in

parents office 502 which has sent out the interference investigation signal, and judges that the channel chil cannot be used. 1211 of interference, it recognizes as asynchronous interference having generated the assumedsame as the pattern currently recorded on the notice signal sending out pattern storage section interference investigation signal receives an error packet, and receives the error packet is the [0096] And when the pattern with which the assumed-parents office 502 which has sent out the

gestalt is the same as the configuration shown in  $extit{draying 4}$  , and only a part of the ectuation [0099] The fundamental configuration of the migration communication system of this operation gestalt of this invention and the asynchronous interference evasion approach are explained. [0098] (5th operation gestalt) Next, the migration communication system of the 5th operation out the notice signal of interference with the pattern which is recorded on the notice signal sending out pattern storage section 1211 of interference and which was defined beforehand essumed parents office 502 which has sent out the interference investigation signal by sending [0097] Thus, it can know that asynchronous interference has generated more certainly the

mentioned above is based on the following reasons. to be used by the assumed-parents station from which two slots on one carrier differ as it is evoidable to use the same carrier. And if a different carrier between different assumed-[0101] By the esynchronous interference evasion approach by this operation gastalt, trying not two or more assumed parents offices use the same slot, but according to this operation gestalt perents stations is used, naturally asynchronous interference will not be ganerated. slots on the carrier. It not only avoids generating of asynchronous interference generated when carrier. Similarly, reception extuation of the notice signal of interference does not perform only carrier, but an interference investigation signal is sent out to all the trensmitting slots on a the stat which is going to use a certain corner, either, but is performed about all the receiving parents station 502, an interference investigation signal is not sent out only to the slot of the [0100] With this operation gastelt, when it is going to use the slot of a carrier with the assumed-

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one carrier differ, asynchronous interference generated with time amount progress is also campletely avoidable. [0103] Therefore, If it is made not to be used by the assumed-perents office where two slots on progress according to the difference of the precision of Xtal built in an assumed parents office. and had not been generated at the beginning-of-using time eney occur with time emount interference which the clock signal which serves as criteria with time amount progress shifted the problem by asynchronous interference should not be generated. However, esynchronous to use a certain dot even if a different assumed parents station uses two siots on one carrier, [0102] If it checks that esynchronous interference has not occurred in case it is originally going

occur per slot using the asynchronous interference evasion approach by other operation by each cerrier and a circuit is crowded After checking that asynchronous interference does not gestalten, two or more slots on one carrier will be used. esynchronous interference evasion approach of this operation gestaft was made to be distributed aircuit is vacant in fact When the slot used by each assumed parents station by the two or more state are used on the cerrier same in this way Since choult capacity falls, when the [0104] However, eithough generating of asynchronous interference is avoidable if it avoids that

RF section 401. that the TDMA-TDD processing section 404 sends out a signel in no becoming irregular to the direct to send out a signal from the ed hoc protocol processing section 405 in no becoming Fregular to the TOMA-TDD processing section 404 differs from the point that it can be directed operation gestaft is the some as the configuration shown in drewing 4 , the point that it can [0108] Although the fundemental configuration of the migration communication system of this gestall of this invention and the asynchronous interference evasion approach are explained. [D105] (6th operation gastalt) Next, the migration communication system of the 6th operation

to the TDMA-TDD processing section 404 differs from the point that the transmitted power of a signal can be directed from TDMA-TDD 404 to the RF section 401. transmitted power of a signal can be directed from the ad boc protocol processing section 405 operation gesteft is the same as the configuration shown in grawing 4 , the point that the [0109] Although the fundamental configuration of the migration communication system of this gestalt of this invention and the asynchronous interference evasion approach are explained [D108] (7th operation gestait) Next, the migretion communication system of the 7th operation interference, by the approach of only act performing the place originally modulated. investigation et the point that it is not necessary to newly define the notice signal of gostait is the point that Interference investigation is easily realizable, by conducting interference does not need to be an interference investigation signal. The effectiveness of this operation irregular instead of sending out an interference investigation signal. The signal sent out here fundamentally the same as the 5th operation gestalt, a certain signal is sent out in no becoming explained. Although actuation of the migration communication system of this operation gestalt is [0107] Next, ectuation of the migration communication system of this operation gestalt is

yadually the range at which the notice signal of interference arrives. from a child office is not detected even if it sends out an interference investigation signal with investigation signal at first. And gradually, if the notice signal of interference from a child office is iffices which interference generates ] minimum hard, and being able to stop it by extending restigation signal, with this operation gestall, it is affective in it being [ the number of the child sfiice becames impossible when an assumed parents office sends out an interference s a problem that interference occurs in a child office and the communication link of a child the maximum transmitted power, it judges with the ability of the slot to be used. Although there not detected, transmitted power is repeatedly investigated until it finally results in the maximum explained. With this operation gestalt, weak transmitted power sends out an interference transmitted power which can be sent out with slight strength. If the notice signal of interference [0110] Next, ectuetion of the migration communication system of this operation gestalt is

eve the same composition as *migr*etion communication system from the above 1st This 0111] Although the 7th operation gostaft explained using the migration communication system mich used the ed had protocal with which the essumed parents station and the child office

> contact which is a key station is used, it can be applied similarly, consists of a migration mechine which is a child office as shown in <u>drawing 14</u>, and a wireless invention is not fasted to this, and even when the usual migration communication system which

constituted by different key station overlap is evoidable can be acquired. generating of asynchronous interference generated in the part which two wireless zones [Effect of the Invention] As explained above, according to this invention, the effectiveness that

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## TECHNICAL FIELD

multiplexing (TDMA; TimeDivision Multiple Access) between two or more key stations and this offices which are communicating by the communication mode which used time-division communication system about the migration communication system which consists of child spproach for avoiding generating of asynchronous interference used expecially in this migration [Field of the Invention] This invention relates to the asynchronous interference evasion

[Translation done.]

JP.2002-118875,A [PRIOR ART]

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### PRIOR ART

systems can be used without making an añon system generate interference, and it can [0003] According to this TDMA method, the frequency more nearly same than two or more and is used by two or more circuits is adopted in much migration communication system. frequency circuit for the purpose of increasing the circuit capacity in the limited frequency bend, cellular phone, is spreading rapidly, the TDMA method which carries out time sharing of the same [Description of the Prior Art] in recent years, since migration communication system, such as a

evoiding generating of this asynchronous interference are proposed. asynchronous interference, the various asynchronous interference evasion approaches for system which has adopted the TDMA method, since it is necessary to avoid generating of such systems. Such interfarence is called asynchronous interference, in the alignation communication [0005] One of the conventional asynchronous interference evasion approaches is proposed by a system clock frequency shifts with time amount progress, interference will occur between two [0004] However, between the systems which ere communicating using the asme frequency, when

5, and migration arachines 6-9. communication system consists of a wirdess communication control unit 1, wireless contacts 2esynchronous interference evasion approach is used is shown in <u>drawing 14</u>. This migration JP,7-87169.A First, the configuration of the migration communication system with which this

communication control unit 1. The migration machines 6-9 are communicating through the system. Woreover, to the mireless contacts 2, 3, 4, and 5, the mireless zones 10A, 10B, 10C, and wireless contacts 2-5 and the wireless communication control unit 1, moving in the inside of a circuit with the migration machines 6-8 to the bottom of management of the wireless contacts 2-5 are supervising the radio channel while performing setup and release of a wireless management of a migration machine, and wireless management of a system. The wireless (III) are set up, respectively. or other migration communication system, and the wireless circuit in a system, migration (2006) Wireless line equipment 1 is performing exchange control with a common public natwork

generation/decomposition of a TDMA signal to the baseband signafing outputted and inputted outputted and inputted from the wireless section 102. Frame generation / decomposition section the modess section 103. The modesn section 103 is performing the strange recovery to the signal 104 is performing generation/decomposition of a frame while performing and received in the antenna section 101, and the signal which are outputted and inputted from machines. The wireless section 102 is performing conversion with the radio signal transmitted rom the modern section 103. This control channel control section 105 is performing control (1008) The antenna section 101 is transmitting and receiving the radio signal between migration detecting element 107, the interfece section 108, and a slot synchronizer 109, respectively. section 105, the communication channel control section 108, an asynchronous interference modem section 103, frame generation / decomposition section 104, the control channel control  $1\underline{6}$  . The wireless contacts 2–5 consist of the entenna section 101, the wireless section 102, the [0007] Next, the configuration of the wireless contacts 2–5 in drawing 14 is shown in drawing

about a control charatel. The communication channel control section 106 is performing control

searched, updated and notified. frequency (2, a slot 4). When an empty carrier becomes unusable, a new empty channel is link, and is notified to the snigration machine 8 as a notice of currier information (in this case, a information about this empty carrier carries and is vacant into the slot 2 under communication prepared for the winders contact 2, and the empty carrier is searched using that slot. The frequency ft. The slot for reserve charmels (in this case, slot 4) which is not usually used is and the wireless contact 2 carry out to it being under communication link using the slot 2 of a migration machine  $\theta$  and the wireless contact 2 as an example. Here, the migration machine  $\theta$ system which adopted this conventional asynchronous interference evasion approach, using the [0009] Next, they are explained using <u>drawing 16</u> shout actuation of the migration communication

notified beforehand. Consequently, a communication channel change is performed without using the migration machine 6 side, and can also be operated similarly. provented. In addition, the asymphronous interference detecting element 107 can be farmed in the communication channel which received interference, and cutting of a wireless circuit can be now cannot receive, and charges it to the communication channel (a frequency 72, stat 4) [0011] The migration machine 8 detects that the signal transmission which has received until to the communication channel (a frequency f2, slot 4) notified as empty carrier information. connection with this measurement result and asynchronous interference is detected, it changes communication channel control section 108 performs asynchronous interference detection in result to the communication charmel control section 108 in the meantime. When the e communication link in the esymphronous interference detecting element 107, and reports the [0010] The wireless contact 2 measures the receiving level of two or more points of a slot during

repect whether a lap occurs from the physical relationship of a wireless contact simply, and it antiguration of a cel may receive effect in a building etc. greatly like PHS, it is difficult to wheless contact 2 and 3 is required, when transmitted power is weak, in order that the 00(13) In this case, although a means to manage the frequency and slot currently used with each contact 2 is using the frequency f1 and the slot 2, for example in  $\frac{1}{2}$  in  $\frac{1}{2}$ , sithough a out is an empty carrier in the installation of a wireless contact. Therefore, when the wireless ifficult [i:] to judge whether a certain frequency and alot are usable. of it being vacant and recognizing a frequency f1 and a stot 2 to be carriers. with which wireless zone 10A and wireless zone 10B lap, the wireless contact 3 has the problem frequency f1 and a stat 2 are not empty carriers for the migration machine located in the part contact side, and searching a carrier is pointed out. In this case, the empty carrier which comes interference evasion approach. First, the trouble in the case of it being vacant in a wireless [0012] However, there ere the following technical problems in the conventional esynctronous

is able to receive until now. ist in their wireless zone first. The reason is that it detects asynchronous interference by 015) The 1st point is that a wirefess contact needs to grasp all the migration machines that terference generated the wireless contact when the signal from a migration machine stopped 2014] Next, the trouble in the case of it being vacent in a migration machine side, and searching ying that a windess contact cannot receive the signal transmission from a mobile station which hen it considers as such a configuration, there are the following troubles. parched, and it will be notified to a wireless contact. Moreover, it becomes to detect generating f asynchronous interference a migration machine side. And it will be known that asynchronous corrier is pointed out. In this case, it will be vacant in a migration machine side, a cernier will be

JP,2002-118875,A [PRIOR ART]

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esynchronous interference occurs. of the input signal of all migration machines. By this approach, when migration machines are a which is vacant from each migration machine and is different as a channel is notified, and [0017] The 3rd point is being unable to determine which charnel should be used, when a channel large number, the load of processing with a wireless contact will become large. [0016] The 2nd point is points that a wireless contact always needs to supervise the existence

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# EFFECT OF THE INVENTION

[Effect of the Invention] As explained above, according to this invantion, the effectiveness that generating of asynchronous interference generated in the part which two wireless zones constituted by different key station overlap is avoidable can be acquired.

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TECHNICAL PROBLEM

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Problem(s) to be Solved by the Inversion] in the part which two wireless zones which consist of conventional asynchronous interference exasten approaches mentioned above with a different wireless contact overlap, there was a trouble that generating of asynchronous interference was noneymidoble.

(0019) The purpose of this invention is offering the asynchronous interference evasion approach generating of asynchronous interference generated in the part which two wireless zonas constituted by different wireless contact overlap being avaidable.

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JP.2002-118875,A [MEANS]

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overlaps between two key stations which connet receive a mutual signal is realizable with a asynchronous interference which may be produced in the part to which each erea to cover (0022) Therefore, the migration communication system which can avoid generating of that asymphranous interference will occur, and other channels will be used for it. packet will occur with the interference investigation signal. Therefore, a child office can know simple configuration. Thereby, if the channel is used, the key station which is going to use a certain channel can know the notice signal of interference to the key station which is going to use a certain channel. that asynchronous interference will occur, if that key station uses this channel, and it sends out sends out an interference investigation signal before using the channet in a child office, an error [0021] If according to this invention the key station which is going to use a certain channel of interference to said key station which has sent out said interference investigation signal occurred, and it is chemisterized by consisting of child offices which send out said notice signal an arror pecket is able to be defined beforehand, it judges with asynchronous interference having uses channels other than seld use schedule channel. When [ which carried out count detection ] of this interference investigation signal is received or an error packet is able to be defined ssynchronous interference generates in the receiving slot corresponding to the sending-out slot carried out count reception ] the notice signal of interference which notifies the purport which beforehand The key etation which judges with esynchronous interference having occurred and channed of the use schedule is sent out to the channel of said use schedule. When [ which or more key stations and ead key station The interference investigation signal for investigating of child offices which are communicating by the communication mode using TDMA between two whether in case it is going to use a certain channel, asynchronous interference occurs in the communication system of this invention in the migration communication system which consists [Means for Solving the Problem] In order to attain the above-mentioned purpose, the migration

pattern which sends out seld interference investigation signal, it judges with asynchronous esynchromous interference having occurred and uses charands other than said use schedule out said notice signal of interference to said key station which has eent out said interference channel. When the generating pattern of a key station of an error packet corresponds with the received or an error packet is able to be defined beforehand. The key station which judges with interference having occurred, and it is characterized by consisting of child offices which send receiving alot corresponding to the sending-out alot of this interference investigation signal is interference which notifies the purport which asynchronous interference generates in the investigation algoral. channel of said use schedule. When [ which carried out count reception ] the notice signal of channel, asynchronous interference occurs in the channel of the use schedule is sent out to the The inborference investigation signed for investigating whether in case it is going to use a certain communication mode which used TDMA between two or more key stations and eald key station. communication system which consists of child offices which are communicating by the (9023) Moreover, other migration communication system of this invention is set to the migration

0024] Moreover, the pattern with which a key station sends out said interference investigation

investigation signal is sent out and twisted immediately after that, and a count becomes the investigation signal continuously, and the pattern with which it continues, an interference twisted, and a count changes regularly, and may be the count which sends out an interference which the interference investigation signal just behind that is continuously sent out, and is and sends out an interference investigation signal continuously, You may be the pattern from pattern from which the count which does not continue and transmit an interference investigation signal between the slots which transmit an interference investigation signal changes regularly, which a key station sends out said interference investigation signal The count which may be the not transmit an interference investigation signal changes regularly. Furthermore, the pattern with which continues and transmits an interference investigation signal between the slots which do period, it may be the pattern which cannot send out an interference investigation signal for every fixed period, but sends out in the other period, and it may be the pattern from which the count signal may be the pattern which sands out an interference investigation signal for every fixed

the key station which was going to use a certain channel and sent out the interference corresponds with the pattern, it can know certainly that asynchronous interference generated pattern defined beforehand and the generating pattern of a key station of an error packet of interference continuously, and the pattern with which it continues, the notice signal of socording to this invention a child office sends out the notice signal of interference by the (0027) Since he is trying to judge with asynchronous interference having occurred when interference is sent out and trusted immediately after that, and a count becomes the same. nvestigation signal. twisted, and a count changes regularly, and may be the count which sends out the notice signed from which the notice signal of interference just behind that is continuously sent out, and is regularly, and sends out the notice signal of interference continuously. You may be the pattern which may be the pattern from which the count which does not continue and transmit the notice the pattern with which this child office sends out said notice signal of interference The count interference between the slots which do not transmit the notice signal of interference. Moreover signal of interference between the slots which transmit the notice signal of interference changes interference for every fixed period, but sends out in the other period, and may be the pattern every fixed period, end it may be the pathern which comnot send out the notice signal of by the pattern set up beforehand. The pattern with which this child office sends out said notice occurred, the count sent out in an interference investigation signal can reduce. succession, as compared with the case where it judges with asynchronous interference having which changes regularly in the count which continues and transmits the notice signal of signal of interference may be the pattern which sends out the notice signal of interference for [0026] Furthermore, you may make it said child office send out said notice signal of interference corresponds with the pattern, when the count error packet of fixed merely occurs only in pattern defined beforehend and the generating pattern of a child office of an error packet according to this invention a key station sends out an interference investigation signal by the [0025] Since he is trying to judge with asynchronous interference having occurred when

packet is received in a receiving slot, said key station takes a synchronization to said notice signal is a notice signal of interference. (0028) Moreover, in other migration communication system of this invention, when an error signal of interference, and may be made to perform processing which checks that the input

error packet generated socording to a certain factor, and asynchronous interference having from a child office can be received, it can prevent incorrect-recognizing it as having received the use a certain channel being a notice signal of interference and the notice eignal of interference (0029) Since according to this invention it can be recognized as the key station which is going to

the carrier with which the channel of a use schedule belongs. signal in other migration communication system of this invention to all the transmitting slots on 0031] Furthermore, you may make it judge with asynchronous interference having generated (1000) Furthermore, you may make it said key station send out said interference investigation

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carrier which has sent out the interference investigation signal of receiving slots or an error [0032] Furtharzora, said interference investigation signal may be a signal non-become irregular. packet is received in other migration communication system of this invention. said key station, when the notice signal of interference is received in one which belongs on the

interference, it can investigate easily whather asynchronous interference has occurred According to this invention, since it is not necessary to newly define the notice signal of

detail with reference to a drawing. [Embodiment of the invention] Next, the gestaft of operation of this invention is explained to a

parents station or a child office, and other equipments serve as a child office. assumed-parents etation out of two or more equipments which can also become an assumedparants station 113 and the child offices 110, 111, and 112 is the same, one set becomes an the assumed-parents station 113 exists in one system. The internal structure of the assumedthat spot, end is a system of the assumed parents station mediation mold with which one set of communication system from an assumed parents office 113 and two or more child offices 110, of the 1st operation gastelt of this invention. Reference of <u>drawing 1</u> constitutes this migration migration communication system which applies the asynchronous interference evesion approach 111, and 112. This migration communication system is the ad hoc natwork which can \*\*\*\*\*\* on [0034] (1st operation gestalt) <u>Drawing I</u> is the block diagram showing the configuration of the

or more child offices may not send out a packet to coincidence. of the assumed-parenta station 113 stot, it is necessary to perform collision combol so that two so that the receiving slot of an assumed parents station and the transmitting slot of a child office may correspond. In order for two or more child offices to share 1 of the slot for reception slot of an assumed parents station and the receiving slot of a child office may correspond, and assumed parents station itself, a child office takes a synchronization so that the transmitting station takes other equipments and a synchronization but operates to the slot timing of the channel per ad hoc network is used. Although it does not carry out that an assumed parents method hare, and a TDMA multiplex number is 4. In this migration communication system, one used TDMA-TDD (Time DivisionMultiple Access-Time Division Duplex) is used as an access operation gestalt — the cordiess handset of PHS — the carrier for a between direct message (1005) the communication link between an assumed parents station and a child office — this

direction packet for collision control of going down) is aims/s sent out to the child office using the transmitting slot ICMA-PE, it gets down for collision control and the direction packet (it is hereafter called the Access with Partiel Echo) technique is used as the control approach of such a collision. In [0036] In this migration communication system, the ICMA-PE (bile-signal Casting Multiple

collision control of going down, and ... the assumed-parenta offices 113 by receiving these direction packets 2001, 2002, and 2003 for the assumed-parents office 113, and the child office 110 can take the synchronization between to <u>drawing 2</u> between the assumed-parents offices 113 in drawing 2, the direction packets 2001, 2002, and 2003 for collision control of going down and \_ are periodically transmitted from [0037] The child office 110 explains the actuation which takes a synchronization with reference

packets 2001, 2002, and 2003 for collision control of going down and - consist of unique WORD 301, the going down information signal 302 the free line / prohibition bit 304, reception / noncontrol of going down and ... is shown in <u>drawing 3</u>. According to <u>drawing 3</u>, the direction (0039) Unique WORD 301 is the field for taking a synchronization, and is a certain decided bit receiving bit 304, the partial echo field 305, and the error detection field 308. [0038] Moreover, the configuration of these direction packets 2001, 2002, and 2003 for collision

received correctly, and when neither the ease where there is an error which carnot be corrected, nor the signal is received, it indicates "un-receiving." When it indicates "unoffice. Reception / non-receiving bit 304 displays "reception", when a signal without an error is pattern. R gets down and an information signal 302 is data transmitted from an assumed-parents forbidding access from other child offices when data are being received from a certain child station to a child office. A free line / prohibition bit 303 is used for displaying "prohibition" and

> there is any channel, and ] an assumed-parents station according to a certain procedure, and it investigating [ whether when building an ad boc network, it is vacant in an available channel and detection field 306 has an error in the packet which received, and it checking, when judged with information which the local station sont is received correctly. It uses for whether the error echo field 305 displays some received date, a child office collates it with this information, and the transmit information, and goes into a resenting procedure. It uses for judging whether the partial receiving" during signal transmission, the child office under data packet transmission halts

being vecent and coming out of it, the packet for collision control is continuously sent out using

a high order layer 410. out, the packet receiving result storage section 408, an interference detecting element 408, and control section 408, the count storage section 407 of interference investigation packet sending the TDMA-TDD processing section 404, the ad hoc protocol processing section 405, the channel equipment from the RF section 401, the clock generation section 402, the entenna section 403, invention and a child office is shown in <u>drawing 4</u> . Reference of <u>drawing 4</u> constitutes this [0040] Next, the configuration of the assumed parents office in the 1st operation gestalt of this

notified to the ad hos protocol processing section 405. channel specified by the ad hoc protocol processing section 405, and to pass it to the ad hoc protocol processing section 405. The function to transmit the data specified from the ad hoc when data are received by the specified channel and a CRC arror is detected, it has the function processing section 405. The function notified to the ad hoc protocol processing section 405 to investigate the received field strength of the channel specified by the ad hoo protocol protocol processing section 405 to the channel specified using the RF section 401. The function when receiving data by the specified channel and unique WORD is not able to be detected. And section 404 performs processing about TDMA-TDD. The function to receive the data of the The enterma section 403 transmits and receives an electric wave. The TDMA-TDD processing the generated clock signal to the RF section 401 and the TDMA-TDD processing section 404. modulation, and a recovery. The clock section 402 generates a periodic clock signal, and supplies [0041] The RF section 401 performs transmission and reception of an electric wave, a

of a channel, and this functions at the time of ad hoc network construction and interference control section 408 has the function to determine the channel used by investigating the opening section 404, in order to play the role which builds and maintains an ad hoc network. The channel transmit and receive the data about the high order layer 410 through the TOMA-TDD processing raceives a control signal through the TDMA-TDD processing section 404, and the function which [0042] The ed too protocol processing section 405 has the function which transmits and

out in order to investigate whether asynchronous interference occurs in the channel of a use memorizes the count of sending out of the interference investigation signal which is a signal sent [0043] The count storage section 407 of Interference investigation packet sanding out

gestalt is explained to a detail with reference to a drawing. [0045] Next, actuation of the asynchronous interference evasion approach of this operation sfot under current recaption memorized by the packet receiving result storage section 408. The the past period, asynchronous interference has generated only the prodetermined slot from the than a predetermined number (packets other than normal reception) is in the receiving result of received only the predetermined slot from the slot under current reception at the past period reception -GRC error unique WORD un-detecting / decode impossible signal) in the slot which high order layer 410 is application which transmits and receives data using an ad hoc protocol The interference detecting element 409 judges whether based on whether the error packet more [0044] The packet receiving result storage section 408 memorizes the receiving result (normal

perticipated in this ad hoc network 504 is explained using <u>drawing 4 - drawing 9</u>. using a channel chi as shown in drawing 5 , and the assumed parents office 502 is going to hold the ad face network 505 using a channel chi under the situation that the child office 503 has [0046] Actuation in case the essumed-parents office 50 i is holding the ad hoc network 504

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[0047] Actuation of the child office 503 in the migration communication system of this operation gostalt is shown in the flow chart of <u>thawing 8</u>, and actuation of the assumed parents office 502 is shown in the flow chart of <u>drawing 7</u>.

[0048] First, although the direction pecket for collision control of going down is always bransmitted using the transmitting slot of a channel ch1, a condition 501, i.e., an assumed-parents office, before the assumed-perents office 502 bolds the ad hor network 505, the assumed-parents office 502 explains the actuation about reception of the child office 503 in the condition that nothing has transmitted, using the flow chart of <u>drawing</u> 8. In such a case, as shown in <u>drawing</u> 8, the assumed-parents office 501 has transmitted periodically the direction packets 2001 end 2002 for collision control of going down, and \_ and the child office 503 has taken the synchronization between the assumed-parents offices 501.

[0049] Here, by the communication link between the assumed-parents station 501 and the child

office 503, an error packet is not generated, but detection of unique MPORD is successful, a CRC to be what is a signal decipherable [ with the ad hop protocol processing section 503 ancessful, a CRC to be what is a signal decipherable [ with the ad hop protocol processing section 405 ] [0050] Moreover, in subsequent explanation, the number of the slots which memorize the receiving result is set to N, the interference detecting element 409 sets to n1 the number of the packets in a past N packet, and the packet reactiving result storage section 408 sets to n2 the error maximum number which sents out an interference investigation packet continuously with firections of the channel control section 408. Moreover, in the communication link between the essumed-parents station 501 and the child office 503, when the number of the error packets of a past N packet has occurred n 3 times or more, since the CHAME does not fulfill criteria communication link quality, processing which changes a channel is performed. In this case, the

(0052) First, the child office 500 receives the signal on the carrier with which a channel chil belongs by the RF section 401, and passes it to the TDMA-TDD processing section 404 (step 801). The TDMA-TDD processing section 404 (step 803). Here, if unique WORD is detected (step 802), and it judges whether unique WORD is detected (step 803). Here, if unique WORD is detected (step 803). Here, if unique WORD is detected (step 803). The received signal is passed to the ed hoc processing section 405 (step 805). It judges whether the ad hoc processing section 405 can decode the signal (step 803), and since it is decipherable (step 807). Next, since the signal which the received signal received here although the judgment of being an interference investigation packet was performed (step 808) is the direction packet processing section 405 (step 809).

child office 503 sends out the channel change demand signal which notifies the purport which changes a channel to the assumed parents station under current communication link, [0051] in addition, N, n1, n2, and n3 are positive integer values, and they are the value of which N2n32n22n1 consists. For exempts, they are N= 240, n3=120, n2=110, and a value, such as

[0053] Next, the interference detecting element 409 investigates the receiving result of a past N packet, and it is judged whether the number of error packets (unique WORD packet which is not detected (a GRO error or ]) is enore than n3 (step 810). Here, since the error packet is not generated, the number of error packets becomes less than [n3], and it is judged whether next the number of error packets (unique WORD packet which is not detected (a GRO error or ]) is more than n1 (step 811). Here, since the number of error packets is less than [n1] special processing is not performed but the following signal is received.

[0054] Next, actuation of the assumed-parents office 502 in case the assumed-parents office 502 is going to hold the ed hoe network using a channel ch1 is explained using the flow chart of

(0055) Here, as shown in  $extit{distinst} ilde{\Sigma}$  , since the assumed parents office SO5 is located in the

packet is again transmitted in the following transmitting slot (step 708). more than n2 (etep 709). When the value is not more than n2, an interference investigation value stored in the count storage section 407 of interference investigation packet sending out is (0058) When judged with the value stored in the count storage section 407 of interference When the notice packet of interference or an error packet is not received, it judges whether the receiving slot immediately after transmitting an Interference investigation packet (step 708) investigates whether the notice packet of interference or an error packet is received in the the count storage section 407 of interference investigation pecket sending out (step 707). And it packet is transmitted (step 706), 1 is added to the count currently recorded on the count storage section 407 of interference investigation packet sending out, and the value is stored in interference investigation packet sending out (step 705), And an interference investigation assumed parents station 502 sets to 0 the value memorized by the count storage section 407 of detected similarly (step 703). Similarly in this case it is not detected (step 704). Then, the whether in a receiving-side slot, the field strength beyond the four continuation threshold E is strength beyond a threshold E is not detected from an assumption (step 702). Next, it supervises channel chil first using the TONA-TDD processing section 404 (step 701), in this case, the field beyand the four continuation threshold E is detected, and I the transmitting-side slot of a channel. Specifically, the assumed parants station 502 supervises [ whether the field strength perents station 502 may hold an ad hoc network, chil is vacant and it investigates whether it is the channel ch1 measured in the assumed-parents office 502. First, in order that the assumedchannel is being used for the received 6eld strength in the transmitting slot and receiving slot of outside of the ed hoo network 504, it shall be below a threshold (it sets with =E) judge that this

investigation packet cending out is step 709 being more than n2, the slot which sent out the interference investigation signal does not occur, but Judges that asynchronous interference is [0057] Next, it investigates whether it checked that the slot of both a transmitting side shot being usable. [10057] Next, it investigates whether it checked that the slot of both a transmitting side and a slot is usable, the transceiver timing of the assumed-parents station 502 is shifted a semicircle approach investigated by the transmitting side, and the assumed-parents station 502 is shifted a semicircle approach investigated by the transmitting side, and the same approach. When it judges that a [0058] Here, actuation of the child office 503 when an interference investigation signal is transmitted is explained using degrains 5 from the assumed-parents office 502. Since the device in which a synchronization is taken between the assumed-parents station 501 and the assumed-parents station 502 closs not exist, one of the following three cases produces the child office

(0059) (1) The case where the assumed-parents station 501 has transmitted [ the interference investigation signal from the assumed-parents station 502 ] no signals also in accordance with the receiving thing and chance of the child office 503 first. Although a child office is received as an interference investigation signal in this case, since the assumed-parents station 501 has usually sent out the direction packet for collision control of going down, this is actually a rare case.

[0050] (2) Next, the case in which (2) assumed parents station 501 has sent out a certain signal when the interference investigation signal from the assumed parents station 502 is not in agreement with the receiving timing of the child office 500, and the interference investigation signal from the unique WORD part and the assumed parents station 502 of the signal did not collide. In this case, the child office 503 will detect a CRC error.

[0061] (3) Moreover, the assumed parents station 501 when the interference investigation signal from the assumed parents station 502 is not in agreement with the receiving timing of the child office 503 and the assumed parents station 501 has sent out no signals is the case in which the interference investigation signal from the unique WORD part and the assumed parents station 502 of the signal collided although the signal was sant out in this case, the child office 503 is unique WORD undetecting.

[0062] Unless a packet loss will be carried out the middle if the assumed-parents office 502

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notice signal of interference is transmitted through the ad hos protocol processing section 405 and the TDMA-TDD processing section 404 (step 618). asynchronous interference having generated the interference detecting element 409, and the this case, since the pecket which received is on interference investigation signal, it judges with the packet which received judges whether it is an interference investigation signal (step 608). In carried out normel reception on the packet receiving result storage section 408 (step 607). Next decade the received signal (step 608). In this case, since it is decipherable, it records having input cignal is passed to the ed hoo protocol processing section 405 noting that a CRC error is not detacted (step 605). It judges whether the ed hoc protocol processing section 405 can WORD has a CRC error next at that which is detected (step 603) (step 604). In this case, an section 404 is passed (step 601). Next, the signal of the decided stot is taken out in the TDMAsignal of the cerrier specified in the RF section 401 is received, and the TOMA-TOD processing [0063] First, the case where (1) occurs even once among nº1 times is explained. In this case, the Actuation of the child office 503 et that time is explained using the flow chart of drawing 6. IDD processing section 404 (step 602). As a result of taking out, it investigates whether unique straints  $\theta$  , the case of above (1), (2), and (3) is generated continuously once [ sum total n ] transmits 1 8001-900n of cantinustion n1 time interference investigation signals as shown in

penerated, and the case of (3) are generated, it explains to according to in front of step 610. WORD. Next, since actuation differs by the case where the case where the case of (2) is about is explained. In this case, it is the same as that of the case of (1) until it checks unique (2006d) Next, when the case of (2) or (3) is penerated, actualion of the child office 503 of an

peaket receiving result storage section 408 (step 813). has protocol processing section 405 received the unique WORD non-detected packet in the packet to the ed hoc protocol processing section 405 (step 812). Then, it records that the ed notifies that the TDMA-TDD processing section 404 received the unique WORD non-detected (0085) Since unique WORD cannot be detected when the case of (3) is generated (step 603), it

error in the peaket receiving result storage section 408 (step 815). Then, it records that the ad had protocol processing section 405 received the packet of a CRC received the packet of a CRC error to the ad hee protocol processing section 405 (step 614). this case, since a GRC error is detected, it notifies that the TDNA-TDD processing section 404 WORD is detacted (step 600), it judges whether next the CRC error has occurred (step 604). In (0066) Next the case where the case of (2) is generated is explained in this case, since unique

spisined using the flow chart of drawing ?. fice 902 after the notice signal of interference was sent out from the child office 503 is 103 about all the cases of (1), (2), and (3), respectively. Next, actuation of the assumed parents [063] As explained above, the notice signal of interference is transmitted from the child office arctocal processing section 405 and the TDMA-TDD processing section 404 (step 618). shown in drawing 8. the notice signed 810 of interference is transmitted through the ad hoo asynchronous interference having generated the interference detecting element 409, and as packets memorized by the packet receiving result storage section 408 is n1, it judges with packets in a past N packet is more than n1 time (step 611). Here, since the number of the error channel change demand signal is not sent out. Next, it is judged whether the number of the error N pecket, delivery sending out of the channel change demand signal is carried out at the TDMA-TDO processing section 404 (step 817). Here, since the number of error peckets is n1 time, e detecting and CRC error / decode impossible) packet has occurred n 3 times or more in a past reference to the packet receiving result storage section 408. When the error (unique WORD uninterference detecting element 409 investigates the receiving situation of a past N packet with [0097] Hemosforth, the case of the case of (2) and (3) is explained collectively again. Next, the

gnal of interference from the child office 503 to be a notice signal of interference, and can be fice 503 can be taken by chance, the essumed parents office 502 can recognize the notice s on error packet. When the synchronization of the assumed parents office 502 and the child ensembled from the child office 500 is received as a notice signal of interference, or to receive 1069) In this case, the assumed parents station 502 is whether the notice signal of interference

> office 503 cernot be taken, as shown in drawing 9, the assumed parents office 502 cernot interference, but receives it as an error packet. recognize the notice signel 910 of interference from the child effice 503 to be a notice signel of received. However, when the synchronization of the assumed parents office 502 and the child

occurred, and will judge the charmed that use is impossible (step 711). 708), the assumed parents station 502 will judge with asynchronous interference having [0070] If the notice signed of interference or one signal of the error packets is received (step

channel change signal to the assumed parents station 501, when having specified the upper limit the child office 503 will receive an error packet 120 times or more continuously and sends out a operation gestalt is applied. That is, n5 becomes between 1 to 9 in this case. Thus, it is because [0072] For example, it will be set to n5=n3-n2=120-110=10 if the concrete number in this carried out in the sense of a check ] — judging — you may make . this operation gestalt two or more times, when continuation no (((ch5(n3-n2) time reception is repeating the interference investigation by the asynchronous interference evasion approach in [ that asynchronous interference has occurred after making it judge with it being unusable or of interference and generates by other factors by chance, it takes into consideration, a server office 513 transmitted as a packet of a CRO error Also when it is not based on the notice signal when the assumed parents office 502 receives the notice signal of interference which the child investigation packet which the assumed purents station 502 sends out losing. Furthermore, is a barger count than n1 (100) which is a threshold for the child office 503 to send out the notice packet of interference, this is for securing the robustness over the interference maximum n2 (110) time sending out of the interference investigation packet. Although this value the notice signal of interference is \*\* Moreover, the essumed parents station 502 cames out the interference investigation signel processing of what is not performed, either and it is, and the notice signal of interference only to the assumed parents office 502 which has transmitted the interference investigation signal the the assumed parents office 501 of <u>drawing 5</u> receives [0071] In addition, even if the assumed parents office which is effective and has not sent out

soction 407 of interference investigation packet sending out is defeted, and the interference investigation signal sending-out pattern storage section 1007 is newly added. detecting element 1009 and the charmel control section 100% respectively, the count storage interference detecting element 409 and the channel control section 406 replace the interference showed the assumed parents office and child office in this operation gostalt to <u>depaint</u> 4, the of this operation gestalt and a child office is shown in <u>drawing 10</u> . To the configuration which gestalt of this invention and the asynchronous interference evasion approach are explained. [0076] The configuration of the assumed parents office in the migration communication system (0075) (2nd operation gastatt) Next, the migration communication system of the 2nd operation en essumed percents station exists in area, and supervises each child office is unnecessary. approach of this operation gastelt, complicated control which grasps all the child offices where interference detects [ the notice from a child office ] by the asynchronous interference evasion parents office which is going to use a channel. Thus, since generating of asynchronous error packet. It can know that asynchronous interference has generated by this the assumedmakes the notice signal of interference the notice signal of interference, or it receives as an notice signal of interference. Then, the assumed-parents station which is going to use a channel station which is going to use the channel for generating of asynchronous interference with the interference occurs, the child office which exists there will notify that to the assumed parents asynchronous interference occurs in the duplication part of erea by it. If asynchronous multiple—times sending out of the interference investigation packet is carried out. Then [0074] The reason is as follows. First, before an assumed-parents station uses a channel muturel signal, and the part to which each area to cover overlaps among 502 is evoided, and it becomes possible to realize without moreover using a complicated controlling mechanism interference which may be produced in the assumed-perents office 501 which carnot receive a gestail, and the asynchronous interference evasion approach, generating of asynchronous [0073] As explained above, according to the migration communication system of this operation

memorized the sending—out pattern of an interference investigation signal. The concrete example of the sending—out pattern of the interference investigation signal memorized by this interference investigation signal eending-out pattern storage section 1007 is shown in <u>drawing</u> [0077] The interference investigation signal sending—out pettern storage section 1007 has

investigation signal continuously. signal sanding-out pattern storage section 1007 rather than sends out an interference gretalt sends it out with the sending-out pattern memorized by the interference investigation pattern storage section 1007. Moreover, the channel control section 1006 is this operation pattern of an error packet is mamorized by the interference investigation signal sending-out algned of interference, when in agreement with the sending-out pattern with which the generating [0079] The interference detecting element 1009 in this operation gastaft sends out the notice out pattern is a pattern beforehund defined besides the above, it may be what kind of pattern. pattern, such as a pattern ( <u>drawing 11</u> (fi) which is changed at random. As long as this sendingthe same, and the count which sands out an interference investigation signal can consider a the interference investigation signal just behind thet are sent out and twisted, a count is made amount ( <u>diewing (1</u> (o)), (4) The count which the interference investigation signal sent out, and investigation signal is sent out and twisted and a count is made to increase in proportion to time <u>straving 11</u> (d) (3) interference investigation signed, and a pattern to which an interference to which spacing is made to increase in proportion to time amount. The count which conds out a interference investigation signal is sent out and there is nothing — a pattern ( drawing 11 (c) —) interference investigation signets of sending out are sent out in the other period (or), an signal cannot be sent out every fixed period, but the pattern ( <u>drawing 11</u> (b)) and (2) investigation signal every (1) fixed period ( <u>drawing 11</u> R> 1 (a)), Or an interference investigation [0078] This sanding out pattern For exemple, a pattern which sends out an interference

[0080] Next, actuation of the migration communication system of this operation gestett is

is desirable for the pattern which an error packet may generate in the actual field to be a completely different pattern. interference investigation signal sending out pattern storage section 1007. As for this pattern, it according to the pattern which is sent out combnuously and which is memorized by the the assumed-parents station 502 uses a channel, there is nothing then sed it is sent out [0081] With this operation gesteft, in case an interference investigation signal is sent out before

everal times, you may judge, erents office 502 which is going to use the channel chi can know generating of asynchronous worket of interference is received at this time or an error packet is received, the assumednterference or an error packet is received, efter scanling out the pattern memorized by the station 502 which is going to use the channel chi supervises whether the notice signal of out pattern with which the generating pattern of an error packet is memorized by the the notice signal of interference immediately. In such a case, the interference detecting element sterference. In this case, in order to secure certainty, as a result of repeating this pattern sterference investigation signal sending-out pettern storage section 1007. When the notice nterference investigation signed sending-out pattern storage section 1007. The assumed parents 1009 sends out the notice signal of interference to except when in agreement with the sendingimmediately when an interference investigation packet is received, the child office 503 sends out storage seetlen 1007, Since it can judge with what esynchronous interference has generated sanding out pattern memorized by the interference investigation signal sending-out pattern with the receiving result memorized by the packet receiving result storage section 408 and the explained. The interference detecting element 1009 of the child office 500 is serially collated [0082] Next, actuation in case a child office sends out the notice packet of interference is

1083] This operation gestaft can reduce the count which sends out an interference investigation gnal by using the pettern which is hard to generate in the ectual field as a sending-out pattern an interference investigation signal.

084] (3rd operation gestalt) Next, the migration communication system of the 3rd operation

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whether it tries repeatedly several times and the channel chil is used. and use of the channel is suspended. When it is impossible to take a synchronization, it judges interference (notice signal 9103 of interference), it is recognized as interference having occurred [008]] in addition, only sufficient count needs to send out the notice signed of interference to As a result of a synchronization being obla to take and receiving, when it is a notice signal of chill stops sending out an interference investigation signal, and it tries so that a synchronization may be taken to these notice signals 9101, 9102, and 9103 of interference, and received in a receiving slot, the assumed-parents station 502 which is going to use the channel 9002 and . When an error packet (error packet by the notice signal 9101 of interference) is channel with this operation gestelt has sent out the interference investigation signals 8001 and deming 12. To the modet to which the assumed parents station 502 which is going to use a (2088) The actuation in the migration communication system of this operation gestaft is shown in with the notice signal of interference sent out from the child office 503 only differ. shifts receiving timing so that the assumed parents office 502 may take the synchronization between the essumed-perents office 502 and the child office 503, performing processing which same as the configuration shown in <u>drawing 4</u> , and when the synchronization cannot be taken (0085) The configuration of the enigration communication system of this operation gestalt is the sestall of this invention and the asynchronous interference evasion approach are explained

recognizing it as having received the error packet generated according to a certain factor, and notice signal of interference from the child office 503 can be received, it can prevent incorrectoffice 502 which is going to use the channal chil being a notice signal of interference and the asynchronous interference having occurred [0088] Since secording to this operation gestaft it can be recognized as the assumed parents detected asynchronous interference in this case can take a synchronization to the notice signets that the assumed parents office 502 which is going to use the channel may stop sending out of the interference investigation signels 8001 and 9002 and .. and the child office 503 which

aut pettern starage section 1211 of interference, a pettern as shown in <u>वाकामंत्र, 1111</u> can be sensing—out pattern of the notice signal of interference memorized by this notice signal sensingthe pattern which sends out the notice signal of interference. As a concrete example of the (0090) The notice signal sending out pattern storage section 1211 of interference memorizes detecting element 1209 and the charmel control section 1206, respectively, and the notice signal the assumed parents office and child office in this operation gastet to disting 4, the sending out pattern storage section 1211 of interference is newly added. interference detecting element 409 and the channel control section 406 replace the interference operation gestalt and a child office is shown in <u>drawing 13</u> . To the configuration which showed configuration of the assumed parents office in the migration communication system of this scatall of this invention and the asynchronous interference evasion approach are explained. The [0088] (4th operation gestait) Next, the migration communication system of the 4th operation

is changed at random. As long as this sending out pattern is a pattern beforehand defined besides the above, it may be what kind of pattern, the notice signal of interference can consider a pattern, such as a pattern ( <u>dreming (1</u> (0)) which behind that are sent out and twisted, a count is made the same, and the count which sends out count which the notice signal of interference sent out, and the notice signal of interference just twisted and a count is made to increase in proportion to time amount ( <u>drawing 11</u> (e)) (4) The PO Halls) interference, and a pattern to which the notice signal of interference is sent out and increase in proportion to time amount The count which sends out the notice signal of drawing [] is sent out and there is nothing — a pattern ( <u>drawing 11</u> (c) —) to which specing is made to interference of sending out are sent out in the other period (or), the notice signal of interference be sent out every fixed period, but the pattern ( drawing 11 (b)) end the notice signal of (2) interference every (1) fixed period ( deviant [1] (a)), Or the notice signal of interference cannot storage section 1211 of interference for example, a pattern which sends out the notice signal of [0091] That is, the sending out pattern memorized by the notice signal sending out pattern

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packet which received is in agreement with the sending out pattern menonized by the notize gostalt judges with asynchronous interference having occurred, when the pattern of the error packet is a notice signal of interference, and the channel control section 1206 in this operation sends out the notice signal of interferance based on the sending out pattern memorized by the this operation gestelt continues the notice signal of interference, and does not send it out, but it signal sending out pattern storage section 1211 of interference. notice signal sending-out pattern storage section 1211 of interference. Mareover, the error [0092] When asynchronous interference is detected, the interference detecting element 1209 in

[0093] Next, actuation of the *migration* communication system of this operation gestalt is

rether than eends out the notice signal of interference continuously, currently recorded on the notice signal senting-out pattern storage section 1211 of interference interference, it sends out the notice signal of interference based on the scribing-out pattern [0034] With this operation gestalt, in case the child office 503 sends out the notice signal of

the actual field to be a completely different pettern. [0095] As for this pattern, it is desirable for the pattern which an error packet may generate in

parents office 502 which has sent out the interference investigation signal, and judges that the channel chil cannot be used. 1211 of interference, it recognizes as asynchronous interference having generated the assumedseme as the pattern currently recorded on the notice signal sending out pattern storage section interference investigation signal receives an error packet, and receives the error packet is the [0096] And when the pattern with which the assumed parents office 502 which has sent out the

postalt is the same as the configuration shown in grawing 4, and only a part of the actuation [0099] The fundamental configuration of the migration communication system of this operation gostalt of this invention and the asynchronous interference evasion approach are explained. sending-out pattern storage section 1211 of interference and which was defined beforehand. out the notice signal of interference with the pattern which is recorded on the notice signal essumed-perents office 502 which has sent out the interference investigation signal by sending [0098] (5th operation gestalt) Next, the engretion communication system of the 5th operation [0097] Thus, it can know that asynchronous interference has generated more certainly the

mentioned above is based on the following reasons. to be used by the assumed-parents station from which two slots on one carrier differ as [0101] By the asynchronous interference evasion approach by this operation gestalt, trying not perants stations is used naturally asynchronous interference will not be generated. it is evoidable to use the same carrier. And if a different carrier between different essumedtwo or more assumed parents offices use the same slot, but according to this operation gestalt, earrier. Similarly, reception actuation of the notice aignal of interference does not perform only stots on the cerrier. It not only evoids generating of asymphronous interference generated when the slot which is going to use a certain carrier, either, but is performed about all the receiving estrier, but an interference investigation signal is sent out to all the transmitting dots on a parents station 502, an interference investigation signal is not sant out only to the stot of the [0100] With this operation gostalt, when it is going to use the slot of a cerrier with the assumed-

progress eccarding to the difference of the precision of Xtel built in an essumed parents office. and had not been generated at the beginning of using time may occur with time emount (0103) Therefore, if it is made not to be used by the assumed parents office where two slots on interference which the clock signal which serves as criteria with time amount progress chiffed, the problem by asymphronous interference should not be generated. However, asymphronous to use a certain slot even if a different assumed parenta station uses two slots on one cerrier, [0102] If it chocks that asynatronous interference has not occurred in case it is originally going

two or more stats are used on the carrier same in this way Since circuit capacity fells, when the [0104] However, although generating of esynchronous interference is avoidable if it evoids that

one carrier differ, asynchronous interference generated with time amount progress is elso

completely avoidable

occur per slot using the asynchronous interference evasion approach by other operation gostalten, two or more slots on one carrier will be used. by each cerrier and a circuit is crowded After checking that asynchronous interference does not esynchronous interference evasion approach of this operation gestalt was made to be distributed circuit is vacent in fact When the slot used by each assumed-parants station by the

that the TDMA-TDD processing section 404 sends out a signal in no becoming irregular to the direct to send out a signal from the ad hoc protocol processing section 405 in no becoming irregular to the TDMA-TDD processing section 404 differs from the point that it can be directed operation gostalt is the same as the configuration shown in  $ext{drewing 4}$  , the point that it can [0108] Although the fundamental configuration of the migration communication system of this gestalk of this invention and the asynchronous interference evasion approach are explained [0105] (8th operation gestalt) Next, the migration communication system of the 6th operation

contact which is a key station is used, it can be explied similarly consists of a exigration machine which is a child office as shown in <u>drawing 14</u>, and a wireless invention is not limited to this, and even when the usual migration communication system which offices which interference generates ] minimum-hard, and being able to stop it by extending have the same composition as migration communication system from the above 1st This [0111] Abhough the 7th operation gestaft explained using the migration communication system gradually the range at which the notice signal of interference errives. investigation signal, with this operation gestalt, it is effective in it being [ the number of the child office becomes impossible when an assumed parents office sends out an interference is a problem that interference occurs in a child office and the communication link of a child which used the ad hoc protocol with which the assumed-parents station and the child office from a child office is not detected even if it sends out an interference investigation signal with transmitted power which can be sent out with slight strength. If the notice signal of interference the maximum transcritted power, it judges with the shifty of the slot to be used. Although there not detected, transmitted power is repeatedly investigated until it finally results in the maximum investigation signal at first. And gradually, if the notice signal of interference from a child office is explained. With this operation gestalt, weak transmitted power sends out an interference to the TDMA-TDD processing section 404 differs from the point that the transmitted power of a signal can be directed from TDMA-TDD404 to the RF section 401. [0110] Next, actuation of the migration communication system of this operation gestalt is transmitted power of a signal can be directed from the ed hoc protocol processing section 405 operation gestalt is the same as the configuration shown in  $extit{devine}4$  , the point that the gestalt of this invention and the asynchronous interference evasion approach are explained [0109] Although the fundamental configuration of the migration communication system of this [0108] (7th operation gestalt) Next, the migration communication system of the 7th operation interference, by the approach of only not performing the place originally modulated. gestall is the point that interference investigation is easily restizable, by conducting interference investigation at the point that it is not necessary to nawly define the notice signal of does not need to be an interference investigation signal. The effectiveness of this operation irregular instead of sending out en interference investigation signal. The signal sent out here fundamentally the same as the 5th operation gastalt, a certain signal is sent out in no becoming explained. Although actuation of the migration communication system of this operation gostalt is [0107] Next, actuation of the migration communication system of this operation gostalt is

(Translation done.)

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# DESCRIPTION OF DRAWINGS

Brief Description of the Drawings)

operation gastalt of this invention. communication system which applies the asynchronous interference evasion approach of the 1st Drawing 1] Drawing 1 is the block diagram showing the configuration of the migration

Desiring 2) It is drawing for explaining the actuation whose child office 110 tokes a

synchronization between the assumed-parents stations 113.

the essumed parents station 113, and drawing showing the configuration of [<u>Drawing 3]</u> They are the direction packet 2001 for collision control of going down sent out from

the 1st operation gestalt of this invention, and a child office. Drawing 4] It is the block diagram showing the configuration of the assumed-parents station of

ist operation gustait of this operation gestait. <u>Desting 5]</u> It is drawing for explaining actuation of the migration communication system of the

 $\overline{ ext{Drewint } I}$  it is the flow chart which shows actuation of the assumed parents office 502 in Ortesing 6] deming 5 -- a core -- it is the flow chart which shows ectuation of an office 503.

case where it is not operating. the assumed parents stations 501, the assumed parents station 502 is drawing explaining the Drawing 8] Performing equation in which the child office 503 takes a synchronization between

explaining the case where the \*\*\*\*\* investigation signal is transmitted. batween the assume<del>d parants stations 501, the assumed parents station 502 is drawing</del> Drawing 9) While the child office 503 is performing actuation which takes a synchronization

the migration communication system of the 2nd operation gostalt of this invention, and a child  $[\underline{Oraning\ (0)}]$  it is the block degram showing the configuration of the assumed-parents station in

pattern storage section 1007 in drawing 10. interference investigation algoel memorized by the interference investigation signal sending-out <u>(Oramine 11)</u> It is drawing showing the concrete example of the sending-out pattern of the

3rd operation gestalt of this invention. 10 rganizarian 12 
m R is drawing aboving the actuation in the migration communication system of the

the migration communication system of the 4th operation gastelt of this invention, and a child <u>[Drawing 13]</u> It is the block diagram showing the configuration of the essumed-parents station in

system using the asynchronous interference evasion approach. [Drawing 14] It is drawing showing the configuration of the conventional migration communication  $\overline{\mathbb{O}_{\mathbf{revins}}}$  15]  $\mathbb{R}$  is the block diagram showing the configuration of the wireless contacts 2–3 in

edapted the conventional esymphronous interference evasion approach. <u>Drawing [6]</u> It is drawing for explaining actuation of the migration communication system which Description of Notations]

Wireless Communication Control Unit

JP,2002-118875,A [DESCRIPTION OF DRAWINGS]

102 Wireless Section 101 Antenna Section 10A-10D Wireless zone 6-9 Migration machine

105 Control Channel Control Section 104 Frame Generation / Decomposition Section 103 Modem Section

106 Communication Channel Control Section

107 Asynchronous Interference Detecting Element

108 Interface Section

109 Slot Synchronizer

301 Unique WORD 2001, 2002, 2003, . The direction packet for collision control of going down

302 Get Down and it is Information Signal.

303 Free Line / Prohibition Bit

304 Reception / Non-Receiving Bit

305 Partial Echo Field

306 Error Detection Field

401 The RF Section

403 Antenna Section

402 Clock Generation Section

404 TDMA-TDD Processing Section

405 Ad Hoc Protocal Processing Section

406 Channel Control Section

409 Packet Receiving Result Storage Section 407 Count Storage Section of Interference Investigation Packet Sending Out

409 Interference Detecting Element

410 Kigh Order Layer

501 502 Assumed parents station 503 Child Office

504 505 Ad hac network 601-618 Step

701-714 Step

9001, 9002, ... Interference investigation signal

910 Notice Signal of Interference

1006 Channel Control Section

1007 Interference Investigation Signal Sanding-Out Pattern Storage Section

1009 Interference Detecting Element

1206 Channel Control Section

1209 Interference Detecting Element

1211 Notice Signal Sending-Out Pattern Storege Section of Interference

[Translation done.]

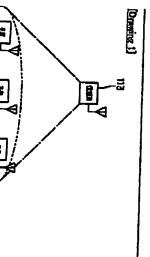
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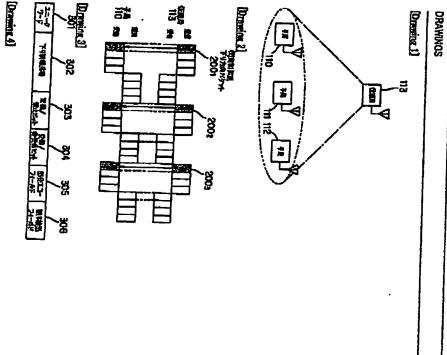
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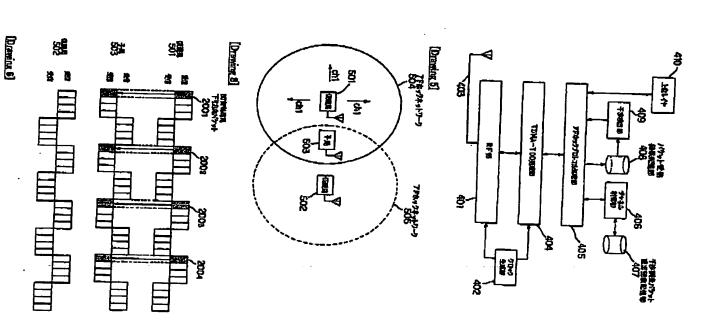
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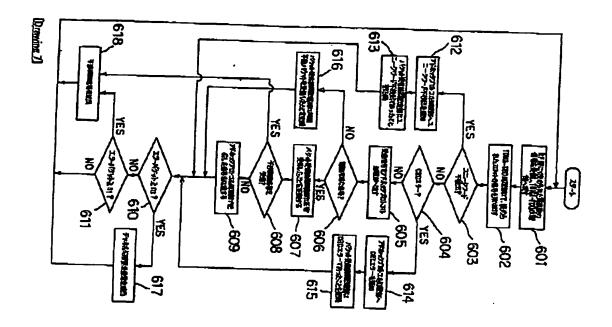
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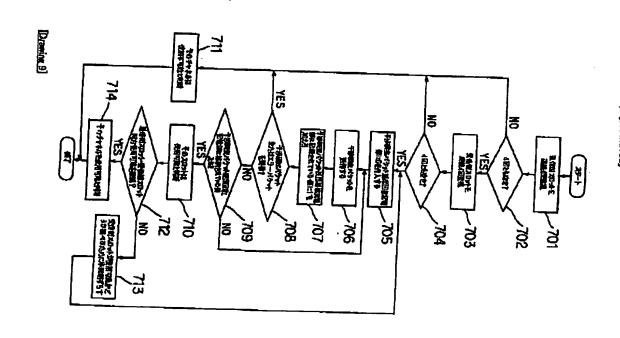
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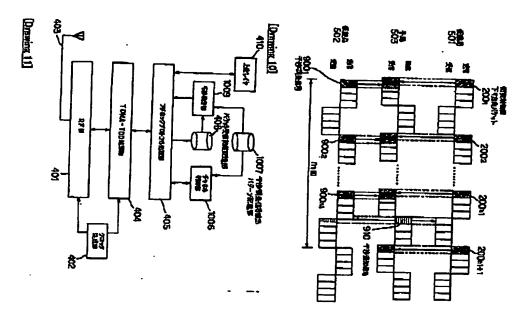


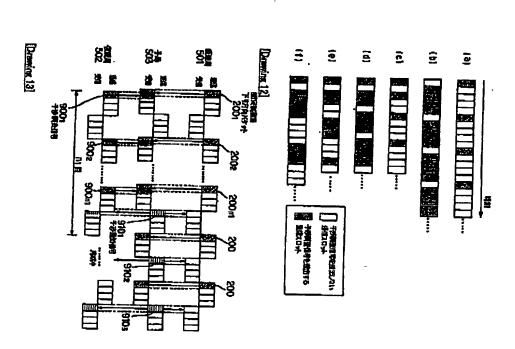


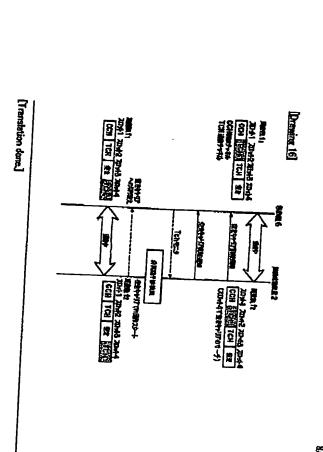










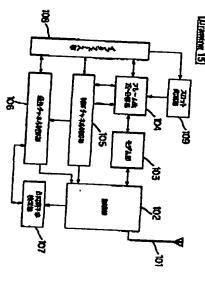


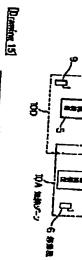
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